1956 Central

Annual Report p. 19

FOREST PEST CONDITIONS IN WISCONSIN

1961

WISCONSIN CONSERVATION DEPARTMENT

FOREST MANAGEMENT DIVISION

FOREST PESTS — SURVEY AND CONTROL

A N N U A L R E P O R T

FOREST PEST CONDITIONS

IN

WISCONSIN

1961

INTRODUCTION

Although forest pest activity varied in each of the areas in 1961, a few problems were common to all of them.

In the Northwest Area the jack pine budworm was one of the principal pests and required chemical control measures on 32,872 acres of timber. Pine tussock moth populations flared sharply over a large area in Douglas and Bayfield Counties posing a threat to jack and red pine stands of all sizes. The large aspen tortrix continued to defoliate aspen over parts of Rusk and Sawyer Counties and in other localized areas. The red-humped mapleworm caused severe defoliation on some hard maple stands, particularly in the vicinity of Cable. Also active but less troublesome in the northwest were bark beetles, scale insects, sawflies, root rots, and white pine blister rust.

The forest tent caterpillar was conspicuous by its absence in the northern counties.

In the Northeast Area broad leaf trees were extensively defoliated. The redhumped mapleworm, generally present throughout the area, caused complete defoliation of a young hard maple stand in Vilas County. Oak stands in Marinette County were defoliated by walkingsticks and the post-oak locust. Walkingsticks were also active in Marathon, Oconto, and Menominee Counties. The oak skeletonizer caused conspicuous discoloration of oak stands from one end of the state to the other. Birch skeletonizer feeding damage was apparent in most of the northern birch stands by late summer. Conifers were attacked by such pests as the Saratoga spittlebug, the jack pine budworm, and balsam gall midge.

An increase in budworm population levels was apparent in the West Central Area, but otherwise no serious problems were encountered. White pine tip weevils were active with about the same intensity as in 1960. Root tip weevil damage continued to appear as did tree mortality due to the root collar weevil. Bark beetles were a problem in some stands.

A number of pests, also reported from other areas, were active in the East Central Area, although they did not appear in epidemic numbers.

Oak wilt was perhaps the biggest problem in the Southern Area.

In addition to control programs for the budworm and Saratoga spittlebug, preventive treatment was applied against white grubs, root collar weevils, and white pine tip weevil. Both mechanical and chemical control were used against the tip weevil.

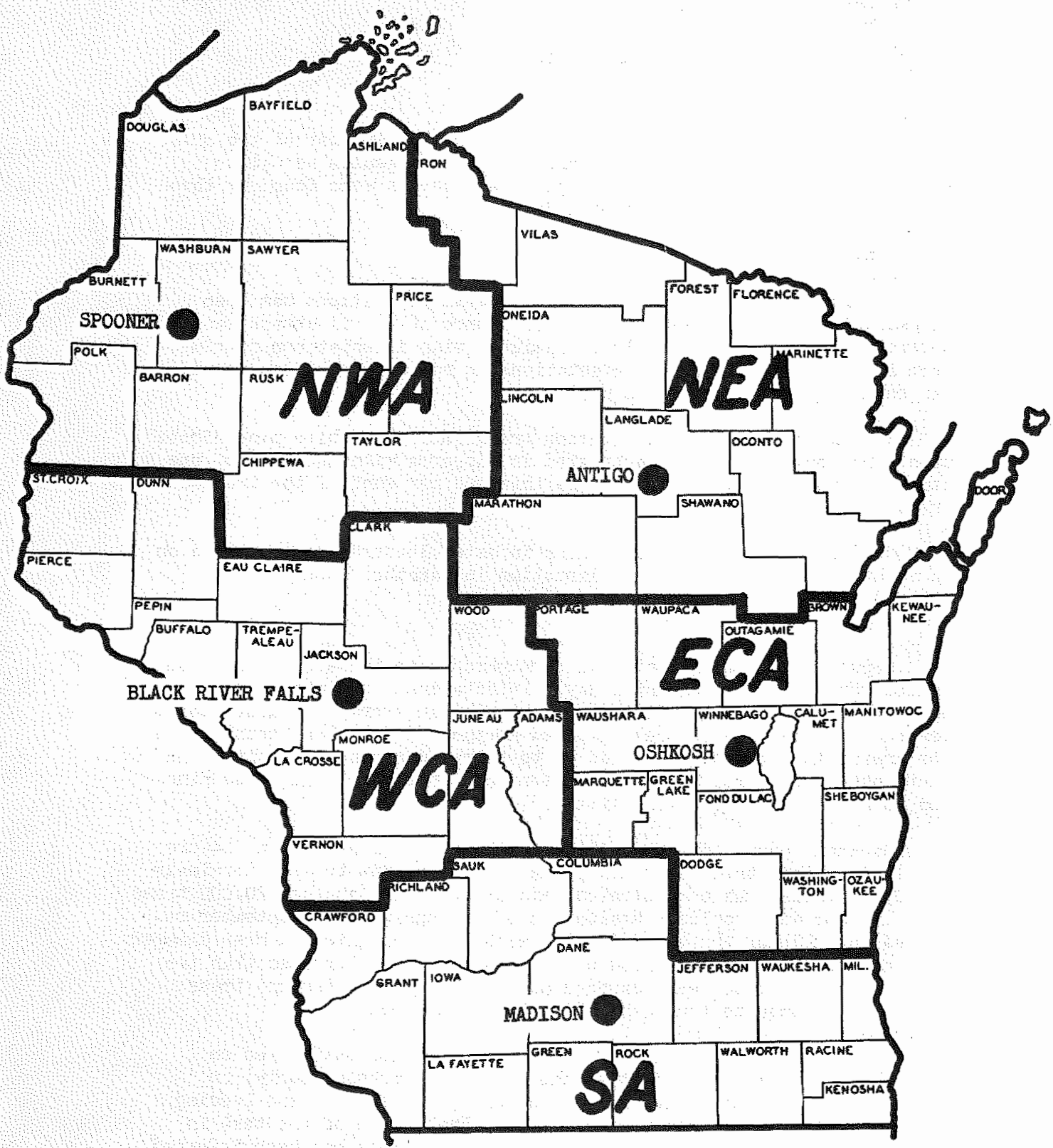
Other work by pest control personnel included an in-training pest control school for observers at Eagle River, setting up field tests with university personnel on hybrid poplar planting, antibiotic control of white pine blister rust, television and radio programs, State Fair and Logging Congress exhibits, work with various school groups, and answering a wide variety and increasing number of requests for assistance with tree pest problems.

The former Menominee Indian Reservation lands were placed under the surveillance of the pest control section. Formerly surveys had been handled by the U. S. Forest Service.

The phenology study on red pine conducted with the assistance of several Department foresters was completed as far as collecting data was concerned. One publication, "A Phenological Survey of Red Pine in Wisconsin" was jointly published by the University and the Department. This was a preliminary report which will be followed by one summarizing the findings on the entire study.

Many thanks are extended to field personnel who continued to do a good job of reporting pests to the pest control section, and for their much appreciated help with various control operations.

OFFICES OF AREA ENTOMOLOGISTS



MAJOR FOREST INSECTS REPORTED

COLEOPTERA

White Pine Weevil -- Pissodes strobi (Peck)

NORTHWEST AREA

Attacks were noticeably lighter than in 1960 in most of the area, generally averaging only one to three per cent. Adults were late emerging in the spring. On May 2 only two weevils were found by three men searching the better part of a day.

NORTHEAST AREA

Generally the trend of white pine weevil populations has been downward the past two seasons. The incidence of weevil attack was moderate in white pine plantings examined, with infestations ranging from five to ten per cent. Infestations in red and jack pine plantings was generally less than seven per cent.

Approximately 17,000 plantation trees including white pine, Scotch pine, and Norway spruce were treated in the area with one-half of one per cent lindane and aroclor. Less than one per cent of the treated trees sustained injury.

Control by clipping and burning infested leaders was practiced an eight-year-old twenty-acre plantation in Marathon County.

WEST CENTRAL AREA

Populations remained at levels comparable to those of 1960. Weevil adults were not observed until May. Infestations in plantations and open stands ranged up to fifty per cent with an average of about thirty per cent in the more severely damaged northern and eastern counties in the area. Infested trees ranged up to thirty per cent in central and southwestern counties but averaged ten to fifteen per cent. Red pine and spruce were damaged very little.

Jackson County continued its weevil control program on a 34-acre plantation first treated in 1959. An eight-man crew treated terminals of 10,000 trees with concentrated lead arsenate and another 20,000 trees with lindane and aroclor. Evaluation of the spraying in September revealed that 22% of the trees treated with lead arsenate had been damaged by weevils. In blocks treated with lindane and aroclor less than two per cent of the trees were damaged and the pattern of damaged trees indicated inadequate treatment of part of the block.

Late spring application of lindane and aroclor was tested on 1,135 white pines in the Tuttle School Forest (Jackson County) on May 19, 1961. At the time of application adult weevils were feeding and oviposition punctures were observed. Evaluation of the test in September showed three per cent of the treated trees had been infested and 19% of the untreated trees in the same plantation had damaged leaders. It appears that use of lindane and aroclor extends the period during which chemical control can be applied in the spring.

EAST CENTRAL AREA

Attacks on open grown white pine ranging from 4 to 20 feet in height were numerous throughout the area. Most plantations showed an increase in the incidence of attack over 1960. White pine and Norway spruce were most seriously affected. Jack pine was infested to a much lesser extent and infested red pines were practically nonexistent. Parasites, predators, and diseases effected 100% control on some leaders, but the incidence was too low to appreciably affect local populations.

Mechanical control by clipping and burning infested leaders was practiced on a planting at the Wild Rose Hatchery in 1960 in an attempt to hold the number of infested leaders at or less than one per cent. The operation was effective and was repeated in 1961. This will continue until a majority of the trees reach a height of 17 feet to insure a good butt log. Some trees have already attained this height.

White Pine Weevil -- Pissodes strobi (Peck)

Notes:

May 12 - First heavy feeding and mating pairs observed in Burnett County.
May 13 - Egg laying observed near Wautoma in Waushara County.
May 17 - Weevils pairing in Langlade County.
May 26 - A few eggs found in Jackson County, adult weevils active.
June 2 - Adult weevils active on white pine leaders in Oneida County.
June 10 - Numerous feeding punctures evident on white pine leaders, larval stage predominant in Marathon County.
June 14 - Pupal chambers being constructed in Juneau County.
June 20 - Larval stage predominant in Jackson County.
June 28 - Pupal chambers being constructed in Wood County.
July 17 - Pre-pupae forming in Oneida County.
July 18 - Pupae observed in Sauk County.
July 26 - Weevils had emerged in a Sauk County planting.
July 27 - No weevil emergence evident in Marinette County.
July 31 - Pupal stage predominant in Adams County.
Aug. 30 - Dead white pine terminals (current) observed in La Crosse County.

Root Collar Weevil -- Hylobius radicis Buchanan

NORTHWEST AREA

This pest continued to take its toll in plantations from 4 to 20 feet in height. Larvae were very numerous during late summer. New infestations were reported in Rusk County as well as in Polk, Burnett, Chippewa, Washburn, and parts of Douglas and Bayfield Counties. Chemical control plots established two years ago showed no apparent change.

NORTHEAST AREA

Scattered red pine windbreaks were attacked in Vilas, Marinette, and Oconto Counties. A severe infestation was reported in a ten-acre Scotch pine planting in Shawano County. A substantial increase in the number of Scotch pine plantings has occurred the past two years, particularly in Oneida, Langlade, Shawano, Marinette, and Oconto Counties.

WEST CENTRAL AREA

Weevil activity is present throughout the area. Damage in most forest plantations is not serious enough to warrant treatment, however, in high value Christmas tree plantations relatively low percentages of infestation and tree loss will justify chemical control. One Jackson County grower treated 150,000 Scotch pines in which losses totalled less than one per cent for the past two years, and with only one or two years to go before harvest.

EAST CENTRAL AREA

Plantations in Marquette, Waushara, and parts of Green Lake, Portage, and Waupaca Counties were heavily infested. Infestations were most noticeable in Scotch pine Christmas tree plantings. Some growers treated their trees with benzene hexachloride while others are removing their Scotch pine and concentrating on red pine.

Note:

Larvae and some adult feeding scars were observed in Richland County on May 23. Larval forms were predominant on Scotch pine in Wood County on July 6.

Root-Tip-Feeding Weevil -- Unidentified

Damage to many West Central Area plantations continued but did not increase in intensity as much as in the previous few years. An area south of Wild Rose in Waushara County was also affected. Hardest hit was Scotch pine with less severe damage occurring on jack and red pine. Site conditions were poor for species attacked.

Considerable mortality occurred in both natural and planted jack pine in the northwest from unidentified root-feeding weevils.

Pine Bark Beetles -- Ips sp.

NORTHWEST AREA

In general, high populations appear to be of one year duration in a particular locality. Some tree mortality occurs, however, before the outbreak subsides. High population build-ups generally occur where cultural operations provide suitable material for breeding. Tree mortality was locally severe in the fall of 1961 around the Mosinee yarding area near Wascott in Douglas County.

NORTHEAST AREA

A locally severe infestation was reported in jack and red pine slash in Oneida County. Timber was being salvaged after a heavy hail storm had struck the area in 1959. The bark beetles had not attacked green standing timber early in the summer but weakened red pine was under attack.

WEST CENTRAL AREA

Bark beetle populations remained at high levels in several localities during 1961. Late summer broods attacked and killed individual trees and groups of trees in Clark, Eau Claire, Jackson, Juneau, Adams, and Wood Counties. The most serious problem areas were in Wood and Adams Counties. Thirty acres of a twenty-year-old Wood County jack pine plantation were thinned in an attempt to increase tree vigor and thereby reduce susceptibility of the trees to attack. Mortality continued in the stand at the rate of about 25 trees per acre.

EAST CENTRAL AREA

Bark beetle problems were few and, in all problem areas examined, trees had been predisposed to attack by factors such as drought, lightning, mechanical damage, and by damage from other insects and disease.

Note:

Adult beetles were observed in Oconto white pine on May 11. Adults and eggs were found in Oneida County on May 24. Ovipositing adults, pupae, larvae were observed in Vernon County on July 14; adults in Sauk County, July 18. Larvae, pupae, and adults present in Wood County material on August 17.

Pityophthorus sp.

Outbreaks which occurred in the northwest in 1960 subsided in all localities. Some tree and twig mortality resulted, but little new activity was found this year.

White Grubs -- Phyllophaga sp.

White grubs were not a serious problem in any of the areas in 1961. Planting sites having a history of high grub populations were treated at the time of planting. Soil insecticides were used for grub control in private and county plantings in Adams, Wood, and Juneau Counties, and in the Black River State Forest planting program.

Recorded acreages treated in East Central Area Counties were as follows:

County	Approximate Acres Treated
Brown	25
Door	71
Dodge	15
Fond du Lac	111
Green Lake	12
Kewaunee	25
Marquette	122
Marinette (WCA)	160
Outagamie	134
Ozaukee	13
Portage	100
Sheboygan	39
Washington	110
Waupaca	120
Waushara	395
Winnebago	16
Total	1,468 acres

A few machines in Southern Area counties also were operated with insecticide attachments.

Wood Borers -- Monochamus scutellatus (Say) and other species

Adults were very numerous in June and July in a fire-killed area of jack pine in Burnett County which had been burned on May 30. Larvae were so numerous in the trees by mid-August that logging operations were halted. Mills refused to accept the wood because of the blue stain which enters the galleries.

Active borers in the charred logs provided an attention-getting display at the State Fair. The I & E Division prepared an interesting tape recording of sounds produced by larvae at work in the wood.

Note:

Buprestid (flat-headed borer) adults and larvae were numerous in burned jack pine in Burnett County on July 19. On the same date in the same area, adults and some eggs of Cerambycids (roundheaded borers) were also numerous.

Weevils

More than 90% of the acorns from a Walworth County collection point were destroyed by weevils.

DIPTERA

Red Pine Needle Midge -- Thecodiplosis piniresinosae

No serious infestations were noted anywhere in the state.

Balsam Gall Midge -- Cecidomyia balsamicola (Lintner)

Small pockets of heavy infestations were reported from Langlade and Oneida County Christmas tree plantings. Damage was serious enough to render some Christmas trees unsuitable for marketing. Light attacks were observed on natural balsam fir. The midge appears to be a serious pest to commercial Christmas tree growers in the northeast in some years.

HEMIPTERA

Saratoga spittlebug -- Aphrophora saratogensis (Fitch)

This spittlebug was not troublesome in any area except the Northeast where it is one of the most serious pests of red and jack pine.

Surveys were made on 4,000 acres of susceptible red pine plantings in the Northwest Area. Approximately 20,000 acres of red and jack pine plantations were checked between June 26 and July 11 in six Northeast Area counties, and spittlebug populations were high enough to warrant chemical control on about 1,500 acres.

The contract for spraying was awarded to Ueding Flying Service of Vincennes, Indiana at a price of $1.86 per acre for the insecticide and its application. DDT was used at the rate of one pound in one gallon of oil solution per acre. Treatment was started on July 25 and completed on July 28.

Acreage treated and the distribution of costs were as follows:

County and Owner	Acreage Sprayed	Cost to Owner	Cost to State	Total Cost
Florence Co. - Co. Forest Crop	67	--	$ 124.62	$ 124.62
Oconto Co. - Co. Forest Crop	40	--	74.40	74.40
Oneida Co.				
Co. Forest Crop	181	19.53	317.13	336.66
Nekoosa Edwards Paper Co.	65	--	120.90	120.90
Esterbrook - Private planting	45	--	83.70	83.70
Burkett - Private planting	100	186.00	--	186.00
Marinette Co. - Co. Forest Crop	662	466.86	764.46	1,231.32
Vilas Co.				
Northern Highland State Forest	215	--	399.90	399.90
Pell - Private planting	35	--	65.10	65.10
Stroh - Private planting	75	--	139.50	139.50
Totals	1,485A	$672.39	$2,089.71	$2,762.10

Notes:

May 8 - Eggs swelling and popping out of red pine buds in Vilas County.
May 22 - Eggs hatching in Langlade County.
May 24 - Fifty per cent of eggs hatched in Oneida County.
June 6 - Egg hatch nearly complete in northeast counties; some first and second instar nymphs present.
June 27 - Nymphs mostly in 4th instar in Marinette County.
July 12 - Nymphs range from 3rd to 5th instar, 4th predominant in Douglas County.
July 18 - Adults numerous in Oneida County.
July 20 - Adults predominant, some still in 5th instar in Douglas County and in northeastern counties.

Pine Tortoise Scale -- Toumeyella numismaticum (P. & McD.)

Two plantations in Polk County were heavily infested, and some twig mortality was apparent. Scattered trees through the rest of the Northwest Area were infested.

Scattered light infestations were reported throughout the Northeast Area jack pine type. Attacks were confined to individual trees or groups of trees with some small trees and reproduction killed.

Note:

Mature females were the predominant stage in Marinette County on May 9, and in Oneida County on May 24. Crawlers had emerged in Florence and Marinette Counties by June 27. Crawlers were predominant and immature scales were observed in Polk County on July 11.

Black Pine Leaf Scale -- Aspidiotus californicus Coleman

The outbreak in Polk County collapsed completely, but much tree mortality resulted. Heavy parasite and predator activity in 1960 apparently eliminated the population.

Crawlers were emerging in Polk County on July 11.

Pine Bark Aphid -- Pineus strobi (Htg.)

Less pine bark aphid damage was observed in the West Central Area during 1961 than during the previous two years. Aphid activity in a small area of severely stunted white in the Clark County Forest has subsided and the trees put on about one-half their normal height growth this year.

This insect was present in light to moderate amounts in seed and transplant beds at Griffith Nursery during the tree lifting period. Nursery stock was not dipped before shipping as was done the previous year since chemical spray programs apparently kept populations down in the nursery beds. There were no reports of problems in other state nurseries or in white pine stands.

Pine Needle Scale -- Phenacaspis pinifoliae (Fitch)

Scale populations dropped to endemic levels in the Mississippi River Valey area. Occasional reports of heavy populations on ornamental plantings were received.

Pine Spittlebug -- Aphrophora parallela (Say)

Populations ranging from light to heavy were reported from the East Central Area, and were consistently higher on Scotch pine. Scotch pine was adversely affected except on sites having a good supply of moisture. Other species in the area did not exhibit damage symptoms except where they were growing in association with Scotch pine.

Similar infestations were reported from all areas.

Second instar nymphs were observed in Oconto County on June 6. Nymphs were in the last instar in Sauk County on June 12.

HYMENOPTERA

Introduced Pine Sawfly -- Diprion similis (Htg.)

NORTHWEST AREA

The high populations of 1960 declined sharply this year. Few spring generation larvae were found and only scattered larvae were observed in the fall, practically all of them harboring parasite eggs.

NORTHEAST AREA

A complete collapse of the severe infestation of 1960 in Marathon and Lincoln Counties was reported. Cocoons collected early in the summer were heavily parasitized by a wasp, Monodontomerus dentipes (Dalman). Birds destroyed many overwintering cocoons.

In late summer larvae were difficult to find in these counties. Adults of the parasitic wasp, Monodontomerus dentipes (Dalman) were observed ovipositing on sawfly cocoons in mid-October.

WEST CENTRAL AREA

Moderate numbers of first generation larvae were observed and second generation larvae were scarce. No new areas of infestation were reported.

Note:

Oviposition was observed in Marathon County on June 10. First generation larvae were feeding in Lincoln County on June 29. Late larval stages were predominant but pre-pupal, pupal, and adult females were observed in Trempealeau and Oneida Counties on July 17. Larval stages were present in Burnett County on July 26.

Red-Headed Pine Sawfly -- Neodiprion lecontei (Fitch)

Only a few scattered colonies were reported from Burnett, Washburn, Rusk, and Sawyer Counties in the Northwest Area.

Populations were very light in all other areas also with only a few isolated colonies reported. Many eggs failed to hatch for some unknown reason in northeastern counties. Larvae were observed actively feeding as late as October 26 in Portage County.

Note:

Oviposition was occurring in Langlade County on June 29. Most larvae were in the third instar in Trempealeau County on July 17 and in the eastern and northeastern counties on July 25. Fifth instar larvae were predominant in Oconto County on August 7. All stages from eggs to mature larvae were observed in Langlade County on August 15.

Larch Sawfly -- Pristophora erichsonii (Htg.)

Populations were generally lower last year in the northwest where few stands showed severe defoliation. Parasites and predators destroyed a high percentage of the cocoons.

Defoliation was light in the northeast except in a few scattered Marinette County stands.

In the West Central Area defoliation was variable ranging up to 80%, but was noticeably less than in the two preceding years.

Populations appear to be steadily decreasing in east central counties with little defoliation apparent in most stands.

Note:

Early to mid-instar larvae were observed in Wood County on June 14. Eggs had just hatched in Langlade County on June 21. Cocooning was starting in Jackson and Eau Claire Counties on July 10.

Red Pine Sawfly -- Neodiprion nanulus Schedl.

Infestations were light over the state on red and jack pine. A few scattered colonies were reported from Polk and Washburn Counties.

Note:

Mostly second instar larvae and a few first instars were observed in Buffalo County on May 16. Eggs were hatching in Marquette County on May 23. Second instar larvae were predominant with some first instars present in a Jackson County location on May 27. The egg stage was still predominant in Bayfield County on May 31. Larvae were mostly in the second instar in Douglas County on June 8.

LEPIDOPTERA

Jack Pine Budworm -- Choristoneura pinus (Freeman)

Since fall egg mass surveys in 1960 indicated that budworm populations could be expected to remain high in the northwest counties in 1961, preparations for anticipated control operations on about 50,000 acres of threatened jack pine timber were made in early winter and during the spring months. Overwintering larval collections observed at the Nevin laboratory corroborated findings in the egg mass surveys. Only selected stands averaging more than 4" d. b. h. were considered for treatment. All plantations were eliminated from the planned spray program.

Consultations were held with department, county, and private industrial foresters. Consideration of timber values involved and the possibility of prompt harvest of timber which might be seriously damaged by the budworm reduced the potential acreage to about 35,000 acres.

A public hearing was held in Gordon on March 14 to acquaint the public with the proposed program, and a zone of infestation was established by the Conservation Commission which included most of the jack pine type threatened. On the following page is a copy of the hearing notice and list of descriptions included in the zone of infestation.

THE STATE CONSERVATION COMMISSION OF WISCONSIN

NOTICE OF PUBLIC HEARING

Notice is hereby given by the State Conservation Commission of Wisconsin, pursuant to Sections 26.30 and 227.021 Wis. Stats., that it will hold a public hearing on Tuesday, March 14, 1961, at 1:30 p.m., in the Gordon Town Hall, Gordon, Wisconsin, on its proposed rules designating a jack pine budworm zone of infestation to include the following described lands:

Bayfield County
Township 44 North, Range 9 West
Entire Township
Township 45 North, Range 9 West
Entire Township
Township 46 North, Range 9 West
Entire Township
Township 47 North, Range 9 West
Entire Township
Township 49 North, Ranges 5 and 7 West
Entire Townships
Township 50 North, Ranges 5, 6 and 7 West
Entire Townships

Burnett County
Township 37 North, Ranges 19 and 20 West
Entire Townships
Township 38 North, Ranges 16, 18 and 19 West
Entire Townships
Township 39 North, Ranges 14, 15, 16, 17, 18 and 19 West
Entire Townships
Township 40 North, Ranges 14, 15, 17 and 18 West
Entire Townships
Township 41 North, Ranges 14, 15 and 16 West
Entire Townships
Township 42 North, Ranges 14 and 15 West

Douglas County
Township 43 North, Ranges 10, 11, 12 and 13 West
Entire Townships
Township 44 North, Ranges 10, 11 and 12 West
Entire Townships
Township 45 North, Ranges 10 and 11 West
Entire Townships
Township 46 North, Range 10 West
Entire Township
Township 47 North, Range 10 West
Entire Township

Polk County
Township 36 North, Ranges 19 and 20 West
Entire Townships

Washburn County
Township 38 North, Range 13 West
Entire Township
Township 39 North, Range 13 West
Entire Township
Township 40 North, Ranges 11, 12 and 13 West
Entire Townships
Township 41 North, Ranges 12 and 13 West
Entire Townships
Township 42 North, Ranges 12 and 13 West
Entire Townships

At that time and place all interested persons or their representatives will be afforded an opportunity to present facts, views or arguments relating to such proposed rules, and all owners of forest lands in the proposed zone of infestation may show cause orally or in writing why the zone should or should not be established.

STATE CONSERVATION COMMISSION OF WISCONSIN

By

/s/ John Beale
John Beale, Chief State Forester

Fish and game management personnel were alerted to the possibility of a spray program and kept informed on its progress so plans could be made to observe the effects of spray on fish and game in the areas to be treated.

The contract for spraying was awarded to the Ueding Flying Service of Vincennes, Indiana on June 2. Spraying operations began on the evening of June 20, and were completed on June 25. Eight Stearman airplanes were used to apply DDT at the rate of one pound in one gallon of oil solution per acre on 32,872 acres of timber. The cost was $1.198 per acre for the insecticide and its application. (Maps on pages 17 to 20).

Daily larval checks conducted during the control operation precluded any possibility of treating areas in which natural controls might have resulted in a collapse of the budworm population. Adequacy of spray coverage, control achieved by the insecticide, and control attributable to natural factors were evaluated by cooperating University of Wisconsin entomologists. Two Department airplanes were used to observe the activities of the spray planes at all times, and in some instances to guide them to spray blocks which were difficult to delineate on the ground.

Manpower, vehicles, radio equipment, and many other needs were filled in part by all the divisions in the Conservation Department. Additional help was received from the University and private industry. Excellent cooperation and willingness of all personnel to get the best possible job done helped to make the operation run smoothly from start to finish.

Jack pine acreage sprayed in each county was as follows:

Burnett	1,655 acres
Washburn	2,644 "
Douglas	18,683 "
Bayfield	9,890 "
Total	32,872 acres

JACK PINE BUDWORK CONTROL - 1961

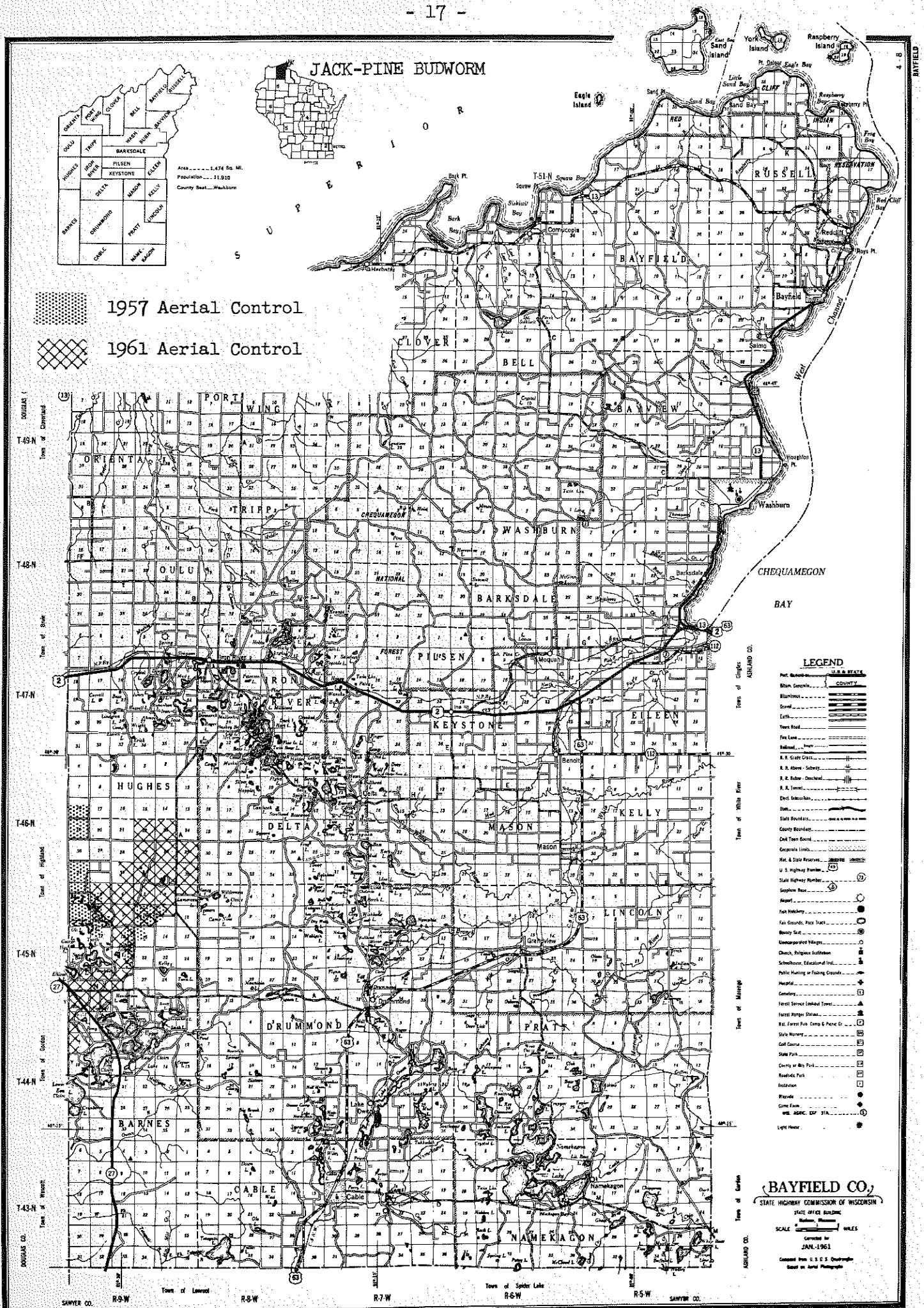
Summary of cost sharing for insecticide and its application:

Owner	Location	Acreage Treated	Owner's Share	State Share	Total Cost
Bayfield Co.	Bayfield Co.	6,462A	$ 3,781.20	$ 3,973.20	$ 7,754.40
Burnett Co.	Burnett Co.	1,655	897.00	1,089.00	1,986.00
Cornell Paper Products Company	Bayfield Co.	133	--	159.60	159.60
	Douglas Co.	2,393	1,339.80	1,531.80	2,871.60
Douglas Co.	Douglas Co.	1,685	915.00	1,107.00	2,022.00
Mosinee Paper Mills Co.	Bayfield Co.	1,806	987.60	1,179.60	2,167.20
	Douglas Co.	8,858	5,218.80	5,410.80	10,629.60
	Washburn Co.	931	462.60	654.60	1,117.20
Nekoosa-Edwards Paper Company	Bayfield Co.	776	369.60	561.60	931.20
	Douglas Co.	115	--	138.00	138.00
	Washburn Co.	27	--	32.40	32.40
W. W. Newsome	Douglas Co.	333	103.80	295.80	399.60
Town of Gordon	Douglas Co.	1,596	861.60	1,053.60	1,915.20
Washburn Co.	Washburn Co.	1,525	819.00	1,011.00	1,830.00
State of Wisconsin	Douglas Co.	1,559	--	1,870.80	1,870.80
Small private	Douglas Bayfield and Washburn Cos.	3,018	--	3,621.60	3,621.60
		32,872A	$15,756.00	$23,690.40	$39,446.40

Egg mass surveys conducted in 1961 indicate that budworm populations were generally lower throughout the Northwest Area. However, a few trouble spots may develop which will require control in 1962.

Jack Pine Budworm -- Choristoneura pinus (Freeman)

In two other areas of the state the numbers of budworms appeared to be higher than in the previous two years. A marked increase in budworm populations was observed on a 4,000 acre tract of timber in the Town of Stephenson, Marinette County (Map of page 21). The jack pine in this area consists largely of 20-year-old plantation-grown trees with stands of larger natural jack pine on the perifery. The last major outbreak in this timber reached its peak in 1957. Egg mass counts in August, 1961 were high but egg parasitism also appeared to be high indicating that the population should have reached its peak and start declining in 1962.


JACK-PINE BUDWORM
1957 Aerial Control
1961 Aerial Control
Area ..... 1,474 Sq. Mi.
Population 31,910
County Seat ..... Washburn
SUPERIOR
CHEQUAMEGON BAY
Sand Island
York Island
Raspberry Island
Eagle Island
Bark Bay
Squaw Bay
Cornucopia
Red Cliff
Bayfield
Washburn
Barksdale
Moquah
Benoit
Mason
Namekagon
Lake Owen
Cable
Grandview
Drummond
Houghton Pt.
Roys Pt.
West Channel
PORT WING
ORIENTA
TRIPP
OULU
WASHBURN
BAYVIEW
CLOVER
BELL
RUSSELL
BAYFIELD
PILSEN
KEYSTONE
EILEEN
HUGHES
DELTA
MASON
KELLY
BARNES
DRUMMOND
PRATT
LINCOLN
CABLE
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R-6-W
R-5-W
LEGEND
BAYFIELD CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE
MILES
Corrected for
JAN.-1961
Compiled from U.S.C.S. Quadrangles
Based on Aerial Photographs

JACK-PINE BUDWORM

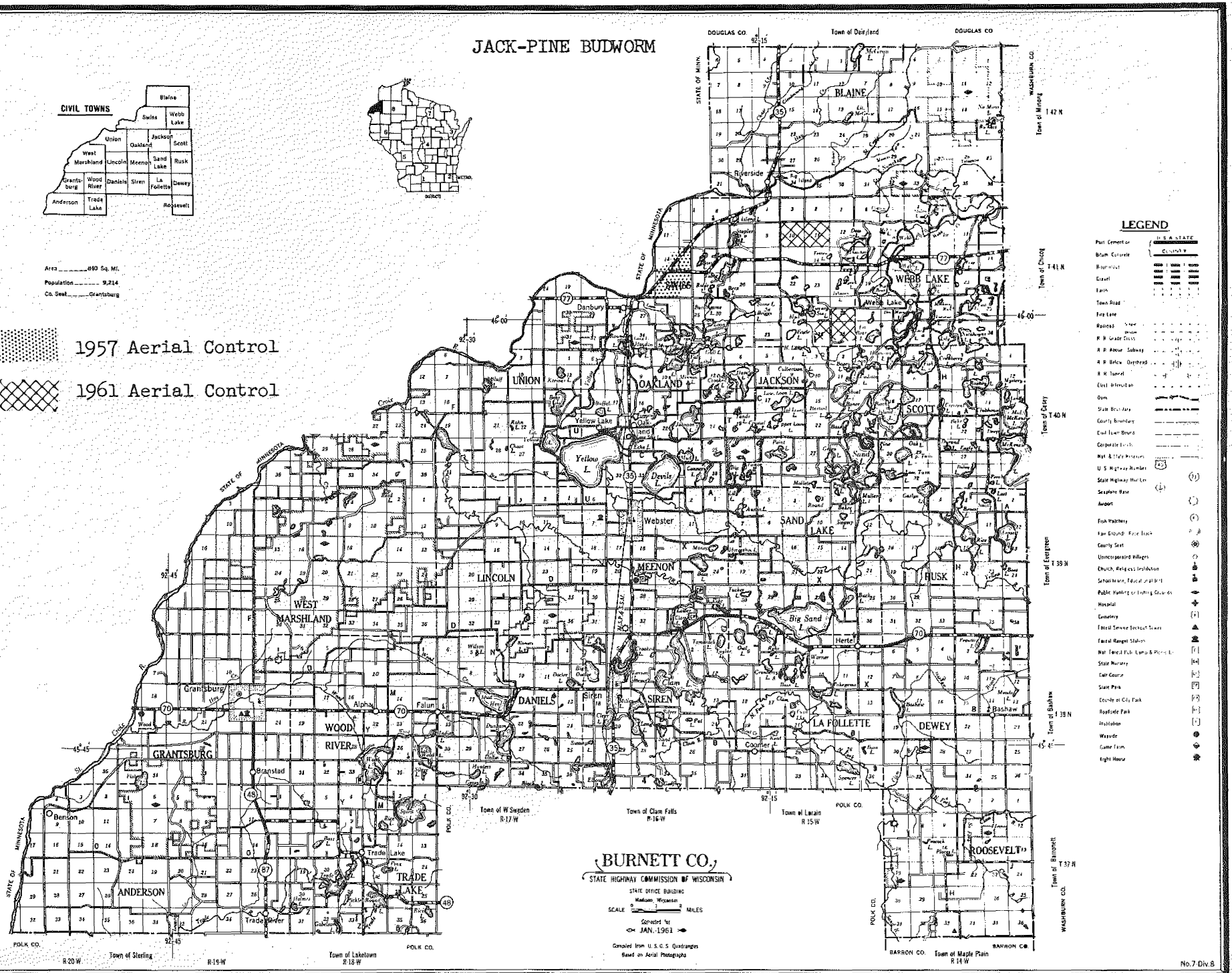
Area _____ 880 Sq. Mi.

Population _____ 9,214

Co. Seat _____ Grantsburg

1957 Aerial Control

1961 Aerial Control



BURNETT CO.

STATE HIGHWAY COMMISSION OF WISCONSIN

STATE OFFICE BUILDING

Madison, Wisconsin

SCALE 0 1 2 MILES

Corrected to JAN.-1961

Compiled from U.S.C.S. Quadrangles

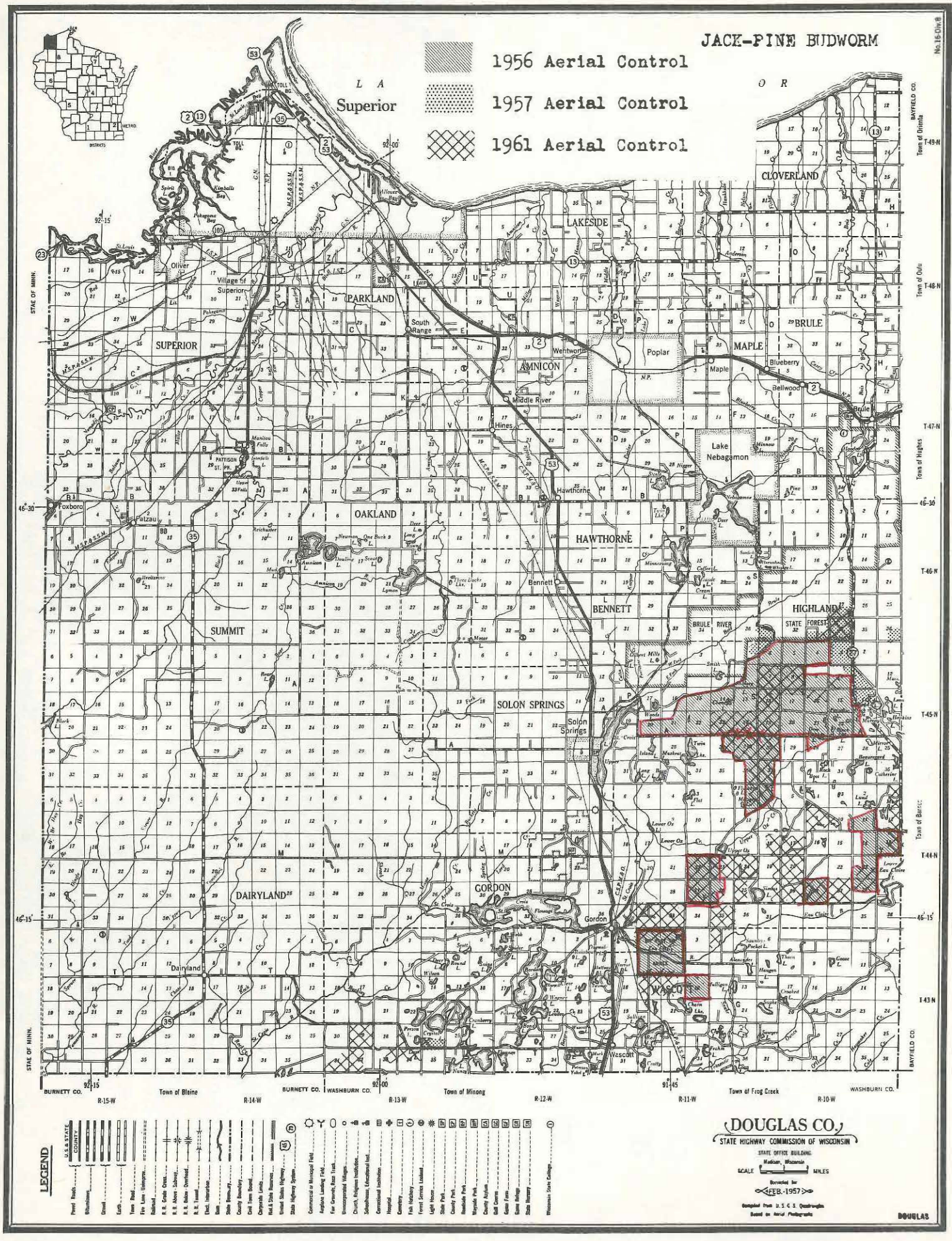
Based on Aerial Photographs

LEGEND

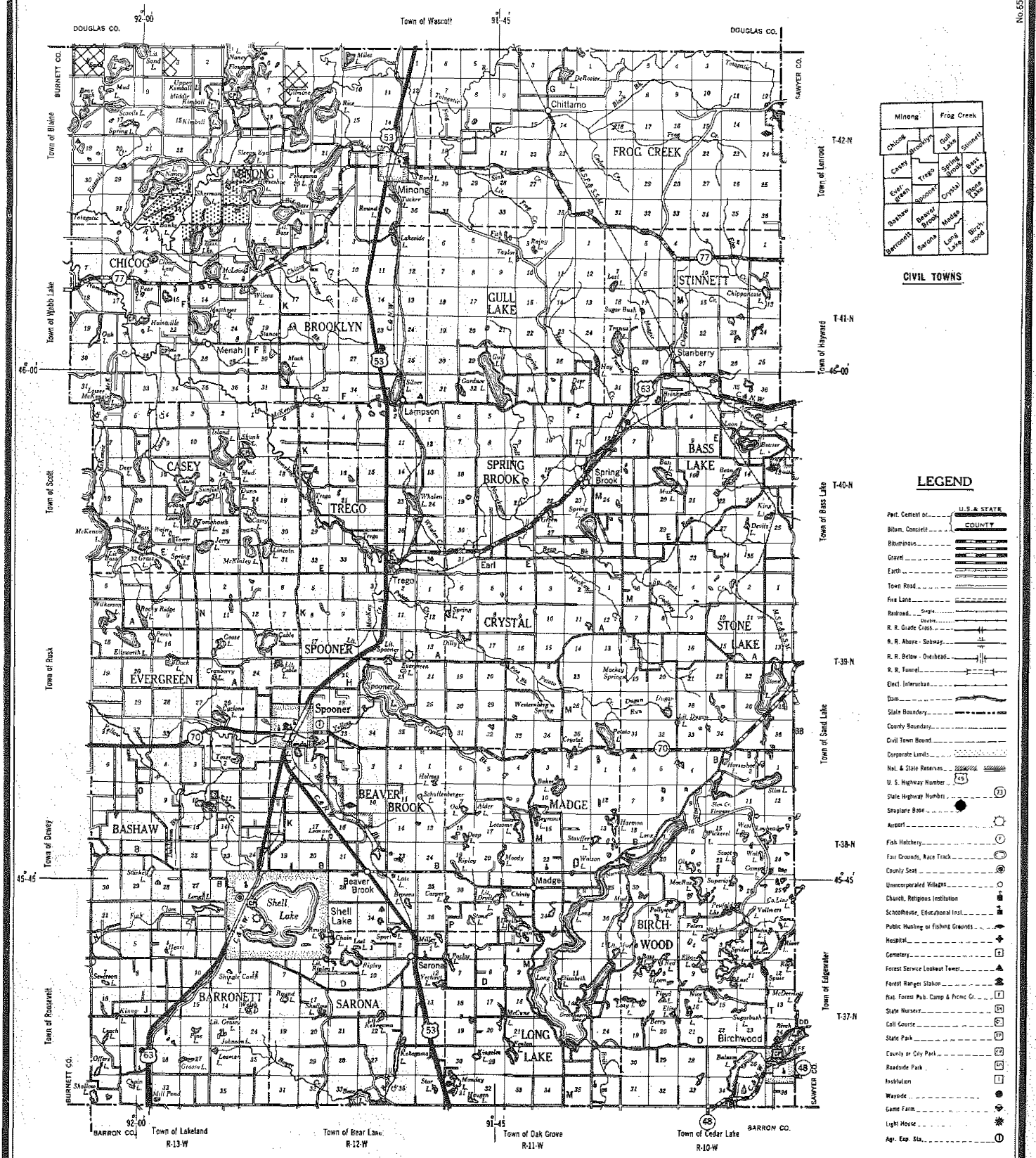
- Port Cement or Bitum. Concrete
- Bituminous
- Gravel
- Earth
- Town Road
- Trail
- Railroad (Single / Double)
- R.R. Grade Cross
- R.R. Above Subway
- R.R. Below Overhead
- R.R. Tunnel
- Elect. Interurban
- Dam
- State Boundary
- County Boundary
- Civil Town Bound.
- Corporate Limits
- Nat. & State Forests
- U.S. Highway Number (45)
- State Highway Number (77)
- Seaplane Base
- Airport
- Fish Hatchery
- Fair Ground: Race Track
- County Seat
- Unincorporated Villages
- Church, Religious Institution
- School House, Educational Inst.
- Public Hunting or Fishing Grounds
- Hospital
- Cemetery
- Forest Service Lookout Tower
- Forest Ranger Station
- Nat. Forest Fish Lunch & Picnic Ground
- State Nursery
- Golf Course
- State Park
- County or City Park
- Roadside Park
- Institution
- Wayside
- Game Farm
- Light House

No. 7 Div. 8

BURNETT


JACK-PINE BUDWORM
1956 Aerial Control
1957 Aerial Control
1961 Aerial Control
L A
Superior
O R
CLOVERLAND
LAKESIDE
PARKLAND
SUPERIOR
BRULE
MAPLE
AMNICON
OAKLAND
HAWTHORNE
BENNETT
HIGHLAND
SUMMIT
SOLON SPRINGS
DAIRYLAND
GORDON
WASCOTT
Village of Superior
Wentworth
Poplar
Maple
Blueberry
Bellwood
Middle River
Hines
Lake Nebagamon
Hawthorne
Foxboro
Patzau
Bennett
Solon Springs
Gordon
Dairyland
Wascott
Oliver
South Range
Brule
BRULE RIVER STATE FOREST
STATE OF MINN.
BAYFIELD CO.
DOUGLAS
BURNETT CO.
WASHBURN CO.
Town of Blaine
Town of Minong
Town of Frog Creek
Town of Oulu
Town of Highes
Town of Barnes
T-49-N
T-48-N
T-47-N
T-46-N
T-45-N
T-44-N
T-43-N
R-15-W
R-14-W
R-13-W
R-12-W
R-11-W
R-10-W
92°15'
92°00'
91°45'
46°30'
46°15'
LEGEND
DOUGLAS CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE
MILES
Revised for
FEB. 1957
Compiled from U. S. C. & G. Quadrangles
Based on Aerial Photographs
DOUGLAS

JACK-PINE BUDWORM



CIVIL TOWNS

LEGEND

- Port. Cement or... / Bitum. Concrete... (U.S. & STATE / COUNTY)
- Bituminous
- Gravel
- Earth
- Town Road
- Fire Lane
- Railroad... (Single / Double)
- R. R. Grade Cross...
- R. R. Above - Subway...
- R. R. Below - Overhead...
- R. R. Tunnel...
- Elect. Interurban
- Dam
- State Boundary
- County Boundary
- Civil Town Bound...
- Corporate Limits
- Nat. & State Reserves...
- U. S. Highway Number... (45)
- State Highway Number... (73)
- Seaplane Base
- Airport
- Fish Hatchery... (F)
- Fair Grounds, Race Track
- County Seat
- Unincorporated Villages
- Church, Religious Institution
- Schoolhouse, Educational Inst.
- Public Hunting or Fishing Grounds
- Hospital
- Cemetery... (C)
- Forest Service Lookout Tower
- Forest Ranger Station
- Nat. Forest Pub. Camp & Picnic Gr.... (F)
- State Nursery... (SN)
- Golf Course... (G)
- State Park... (SP)
- County or City Park... (CP)
- Roadside Park... (RP)
- Institution... (I)
- Wayside
- Game Farm
- Light House
- Agr. Exp. Sta... (AES)

1957 Aerial Control

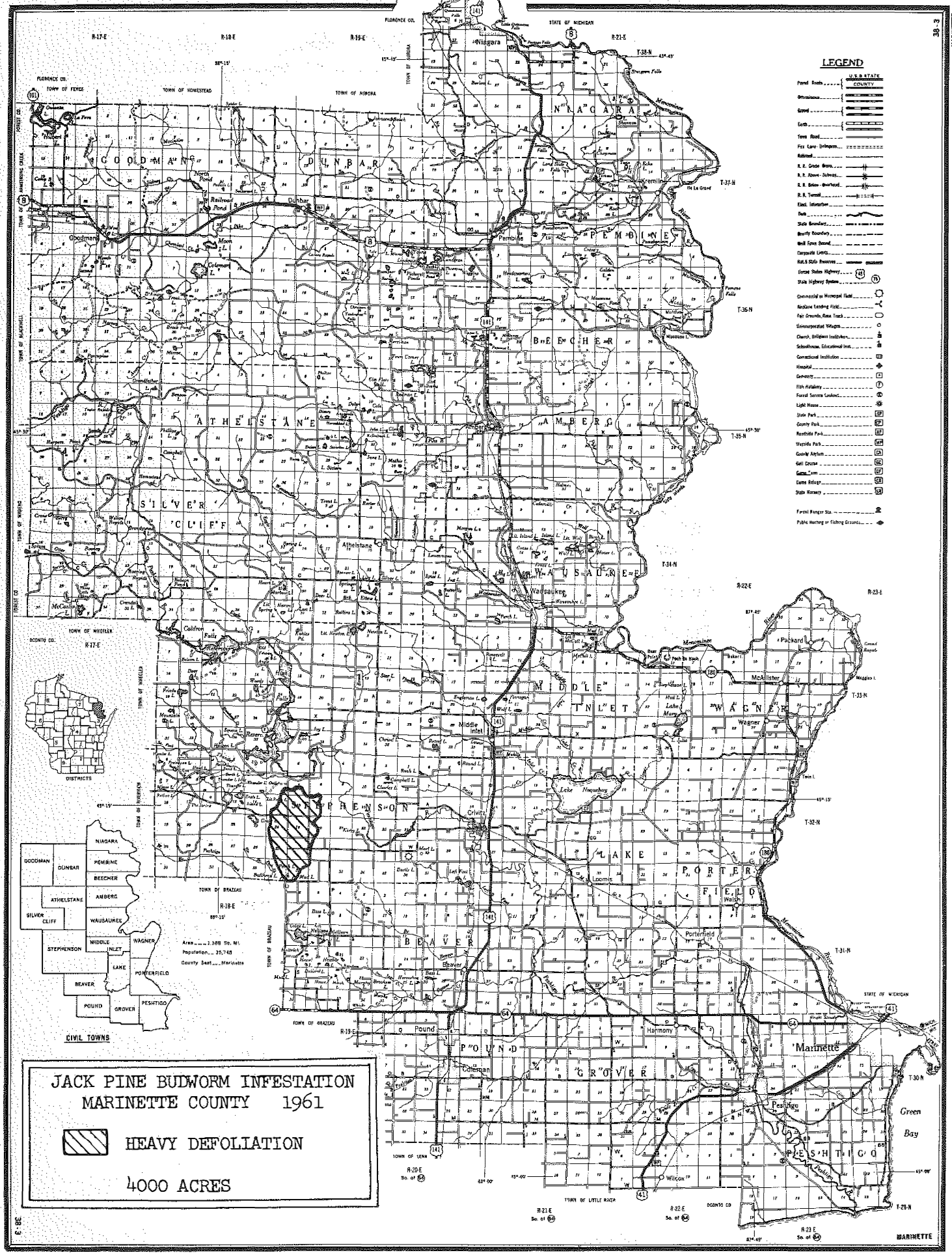
1961 Aerial Control

WASHBURN CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE 1 MILES
Corrected for
JAN.-1961
Compiled from U. S. G. S. Quadrangles
Based on Aerial Photographs

WASHBURN

No.65-Div.8

No.65-Div.8


LEGEND
U.S. & STATE
COUNTY
Town Roads
Unimproved
Gravel
Earth
Town Road
Fire Lane - Swimpers
Railroad
R. R. Grade Brass
R. R. Above - Subway
R. R. Below - Overhead
R. R. Tunnel
Elect. Interurban
Dam
State Boundary
County Boundary
Civil Town Bound.
Corporate Limits
Nat'l & State Reserves
Horse State Highway
State Highway System
Commercial or Municipal Field
Airplane Landing Field
Fair Grounds, Race Track
Unincorporated Villages
Church, Religious Institution
Schoolhouse, Educational Inst.
Correctional Institution
Hospital
Cemetery
Fish Hatchery
Forest Service Lookout
Light House
State Park
County Park
Monthly Park
Waysida Park
County Asylum
Golf Course
Game Farm
Game Refuge
State Nursery
Forest Ranger Sta.
Public Hunting or Fishing Grounds
GOODMAN
DUNBAR
NIAGARA
PEMBINE
BEECHER
ATHELSTANE
AMBERG
SILVER CLIFF
WAUSAUKEE
MIDDLE INLET
WAGNER
STEPHENSON
LAKE
PORTERFIELD
BEAVER
POUND
GROVER
PESHTIGO
Niagara
Dunbar
Goodman
Pembine
Athelstane
Wausaukee
Middle Inlet
Loomis
Porterfield
Pound
Coleman
Harmony
Marinette
Peshtigo
Green Bay
Lake Noquebay
Lake Metonga
Caldron Falls
Packard
McAllister
Wagner
Walsh
Wilson
Area ..... 1,388 Sq. Mi.
Population... 35,748
County Seat ... Marinette
DISTRICTS
CIVIL TOWNS
JACK PINE BUDWORM INFESTATION
MARINETTE COUNTY 1961
HEAVY DEFOLIATION
4000 ACRES

Budworm populations were higher in the West Central Area than during the three previous years. Three small areas of medium defoliation were observed in Eau Claire and Jackson Counties. Light defoliation was observed in many jack pine stands in the area. Egg surveys indicated that moderate populations could be expected in 1962 depending on the effects of parasitism and other natural controls.

The budworm was present in the East Central and Southern Area but not in damaging numbers. It was observed feeding on red pine and white pine in the Kettle Moraine State Forest.

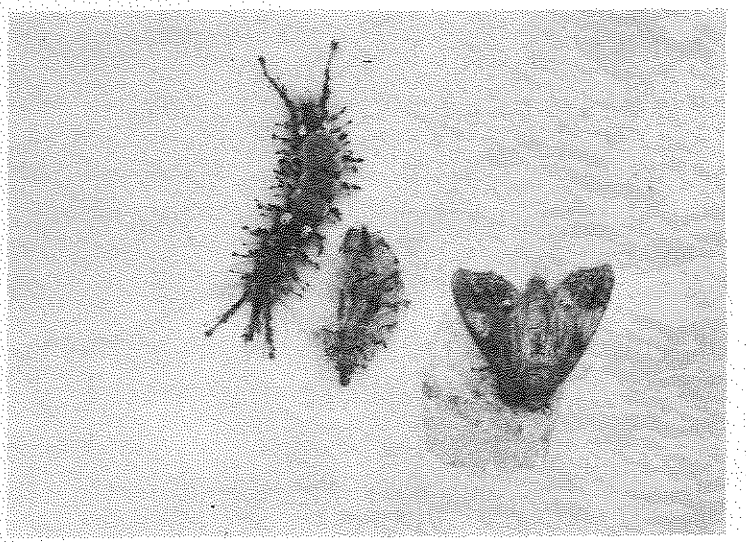
Notes:

May 16 - Larvae were moving from hibernaculae to new shoots in Washburn, Douglas, and Burnett Counties.
May 24 - Larvae were mostly second instar, some third instar in Wood, Adams, Jackson, and Juneau Counties.
June 1 - Larvae were mostly third instar, some second in Eau Claire County. In Bayfield, Burnett, Douglas, and Washburn Counties larvae were mostly second instar with a few third instar in Burnett County.
June 9 - Larvae were mostly third instar with a few fourth instar in Washburn County. Larvae ranged from third through fifth instar, but were predominantly fourth in Jackson County.
June 30 - Pupal stage was predominant, some sixth instar in Jackson County. The pupal stage was predominant in Portage and Adams Counties.
July 10 - Pupation was 50% complete in the Northwest Area. Moth emergence was starting in Douglas County.
Aug. 15 - Heavy egg parasitism observed in Marinette County.

Pine Tussock Moth - Dasychira plagiata (Walker)

Tussock moth larvae were quite numerous in some Northwest Area jack pine stands, where in conjunction with the jack pine budworm they caused complete defoliation of stands along the Bayfield-Douglas County line. Moths were very numerous and oviposition was completed about August 15. Egg masses were abundant over an area of about 60,000 acres, and surveys revealed up to 3,000 eggs at a collection point during a 10 minute counting period (Maps on pages 24 to 26). Eggs were laid on pine needles, small twigs, and branches, and even on grass blades in open areas where heavily laden females were unable to make the flight from one tree to another.

Hatching of the eggs took place between August 15 and August 22. In some localized spots parasite emergence holes were noted on egg clusters. In examining some eggs which had failed to hatch, but in which the shell was intact, it was observed that no embryo had formed. Larvae generally fed for about ten days before going into hibernation, although a proportionately small number fed much longer. Severe browning of the current year's growth of jack and red pine of all sizes was the result of this fall feeding. Suitable survey techniques must be worked out for the tussock moth, and it is anticipated that chemical control



Larva, cocoon containing pupa, and
adult of pine tussock moth.

Notes:

June 26 - Larvae were one-half to three-fourths inch long in Bayfield, Burnett, and Douglas Counties.

July 10 - Late larval stages, some pupae observed in Bayfield County.

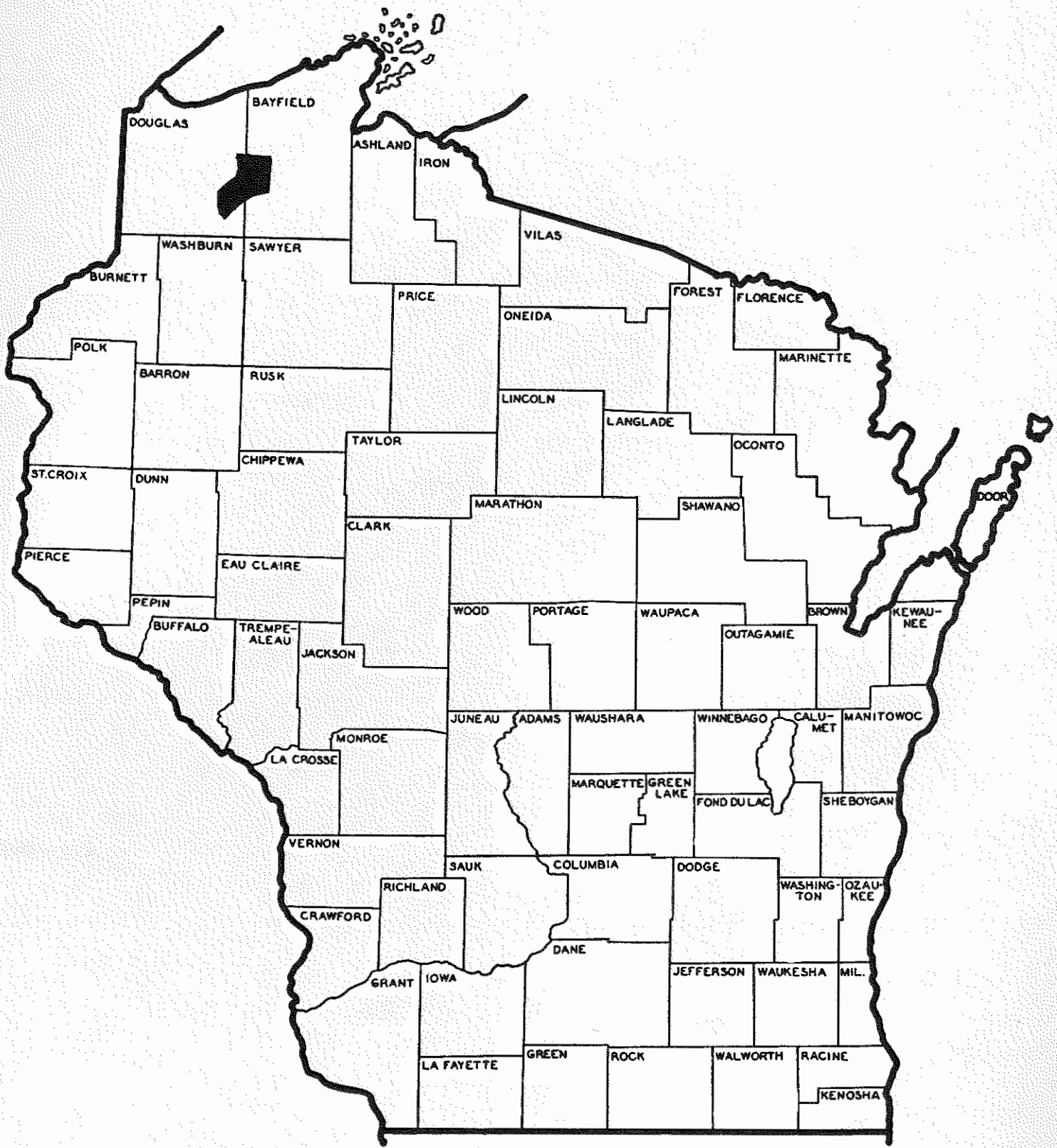
July 18 - Pupation starting in Oneida County.

July 20 - Mostly pupated; some late instar larvae and a few moths in Bayfield and Douglas Counties.

July 28 - Moths predominant stage, some pupae and eggs observed in Bayfield County.

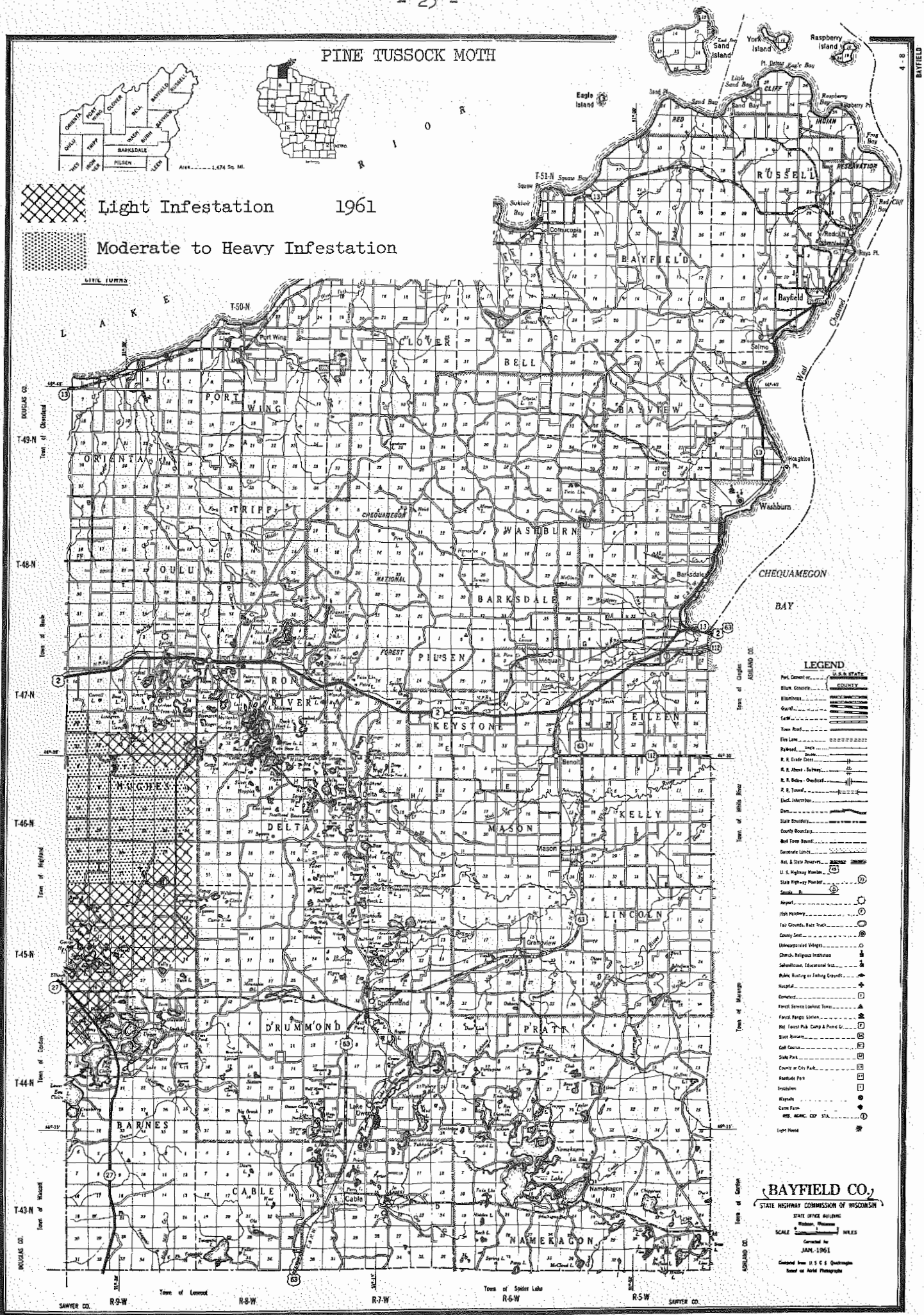
Aug. 9 - New larvae were predominant, some eggs yet unhatched in Bayfield County.

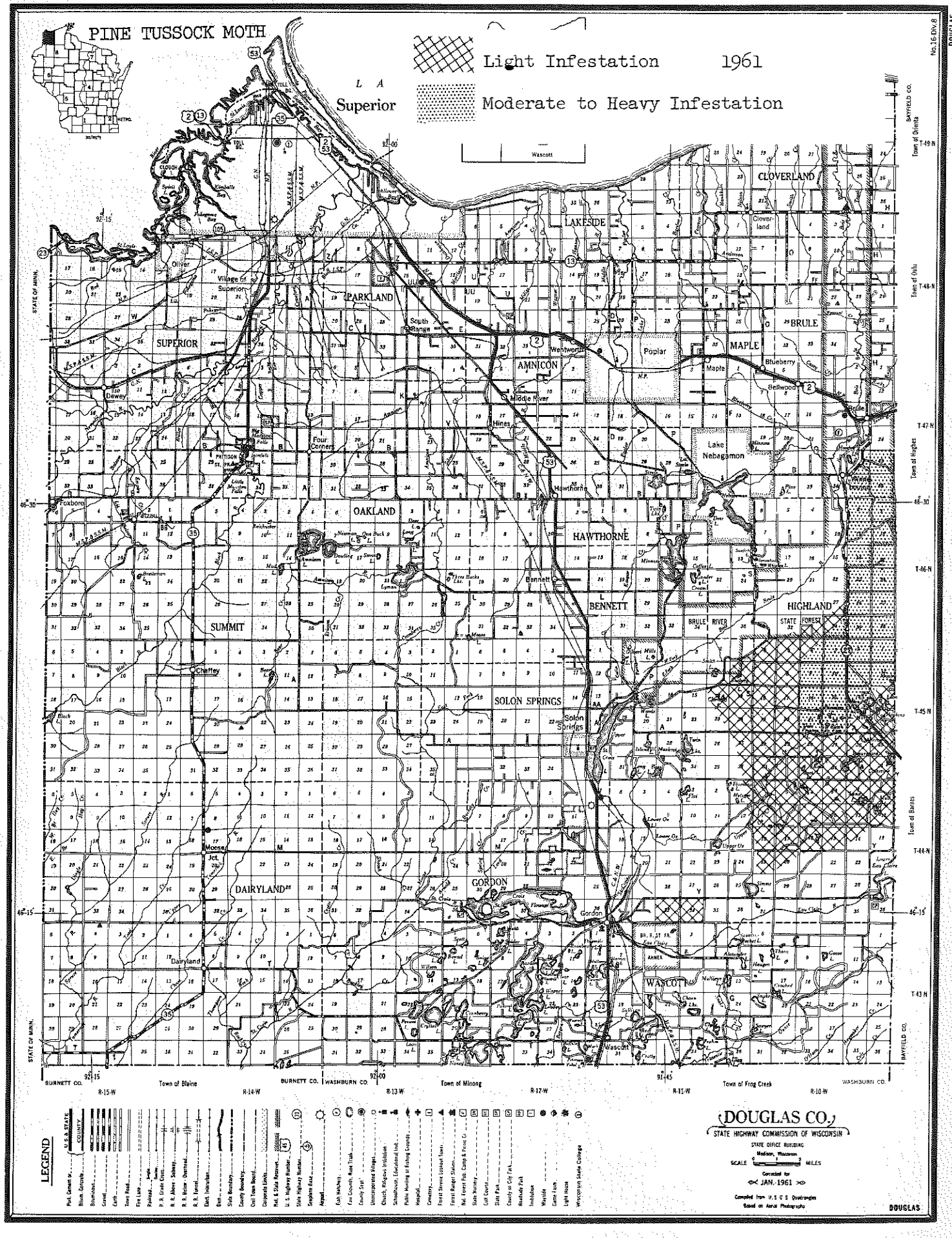
Aug. 29 - New larvae going into hibernation in Douglas and Bayfield Counties.



GENERAL AREA OF PINE TUSSOCK MOTH INFESTATION

1961


PINE TUSSOCK MOTH
Light Infestation 1961
Moderate to Heavy Infestation
Area 1,474 Sq. Mi.
LAKE SUPERIOR
CHEQUAMEGON BAY
Sand Island
York Island
Raspberry Island
Eagle Island
Port Wing
Bayfield
Washburn
Barksdale
Mason
Grandview
Drummond
Cable
Namekagon
Lake Owen
Benoit
Cornucopia
Salmo
Meteor
Mequon
Houghton Pt.
Red Cliff Bay
Frog Bay
Raspberry Bay
Little Sand Bay
Sand Bay
Squaw Bay
Skeleton Bay
Pt. Detour
Eagle Bay
Rocky Pt.
Boys Pt.
CLOVER
BELL
PORT WING
BAYVIEW
ORIENTA
TRIPP
WASHBURN
OULU
BARKSDALE
PILSEN
IRON RIVER
KEYSTONE
EILEEN
HUGHES
DELTA
MASON
KELLY
LINCOLN
D'RUMM'OND
PRATT
BARNES
CABLE
NAMEKAGON
RUSSELL
INDIAN RESERVATION
CHEQUAMEGON
NATIONAL FOREST
T-50-N
T-49-N
T-48-N
T-47-N
T-46-N
T-45-N
T-44-N
T-43-N
R-9-W
R-8-W
R-7-W
R-6-W
R-5-W
LEGEND
BAYFIELD CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE
MILES
Corrected to
JAN. 1961
Compiled from U.S.G.S. Quadrangles
Based on Aerial Photographs


PINE TUSSOCK MOTH
Light Infestation 1961
Moderate to Heavy Infestation
Superior
Wascott
CLOVERLAND
LAKESIDE
PARKLAND
SUPERIOR
AMNICON
BRULE
MAPLE
OAKLAND
HAWTHORNE
BENNETT
HIGHLAND
SUMMIT
SOLON SPRINGS
DAIRYLAND
GORDON
WASCOTT
Village of Superior
Four Corners
Lake Nebagamon
Middle River
Hawthorne
Bennett
Solon Springs
Moose Jct.
Dairyland
Gordon
Wascott
Poplar
Maple
Blueberry
Bellwood
Wentworth
Oliver
Dewey
Foxboro
Patzau
Chaffey
Hines
BRULE RIVER STATE FOREST
DOUGLAS CO.
STATE HIGHWAY COMMISSION OF WISCONSIN
STATE OFFICE BUILDING
Madison, Wisconsin
SCALE 0 1 2 MILES
Corrected for JAN. 1961
Compiled from U.S.G.S. Quadrangles
Based on Aerial Photographs
LEGEND
BURNETT CO.
WASHBURN CO.
BAYFIELD CO.
STATE OF MINN.
Town of Blaine
Town of Minong
Town of Frog Creek
Town of Oulu
Town of Hughes
Town of Bates
Town of Oriental
R-15-W
R-14-W
R-13-W
R-12-W
R-11-W
R-10-W
T-49-N
T-48-N
T-47-N
T-46-N
T-45-N
T-44-N
T-43-N
92°15'
92°00'
91°45'
46°30'
46°15'

will undoubtedly be necessary on part of the area affected. A chemical more effective than the DDT now in use will perhaps have to be found, and the best time for application determined since early control will be necessary in order to save some of the infested stands.

The tussock moth was also observed feeding on red pine in Lincoln County but numbers were not high enough to cause concern.

Red-Humped Maple Worm -- Symmerista albifrons (J. E. Smith)

Scattered sugar maple stands of various ages, from Vilas County westward into Douglas County, were defoliated partially to completely by this mapleworm. Defoliation, severe enough to be discernible from the air, was observed on estimated 8,000 to 10,000 acres, and occurred in late summer. The most extensive single area of defoliation was in the vicinity of Cable and Lake Namekagon in Bayfield County. Although the insect was observed throughout northern hard maple stands, discernible defoliation was observed in aerial surveys only in Vilas, Iron, Sawyer, Bayfield, Ashland, and Price Counties. Lighter defoliation was reported by ground observers in the vicinity of Summit Lookout Tower in Douglas County and in part of the Flambeau State Forest.

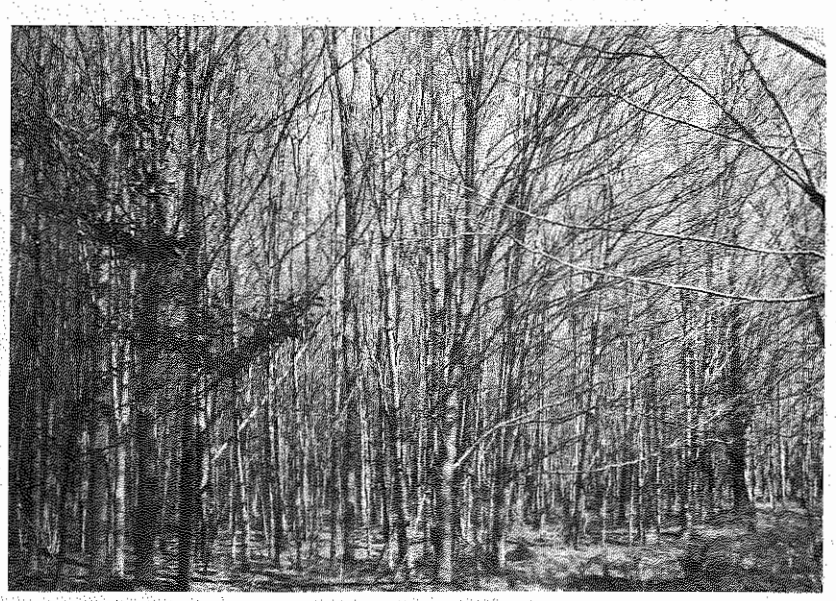
Defoliation near Big Lake in the Town of Land O' Lakes, Vilas County, was complete on a small acreage of coppice-growth hard maple for the second consecutive year. Permanent 1/5-acre study plots were established in this stand which was completely defoliated by August 20, and in the peripheral timber which was stripped of foliage by September 2. Within the plots all obviously dead host plants were knocked down and living trees marked for future observations.

Pupal parasites appeared to be very active in areas of complete defoliation. Many of the pupae contained larvae of an unidentified fly. Others had been killed by a species of the fungus Cordyceps the fruiting bodies of which were commonly observed in the leaf litter. A few larvae on the fringes of the completely defoliated area appeared to have been killed by a polyhedral virus. Although pupation was generally completed by the first week in October, larvae were observed feeding as late as September 28 after a sharp frost had occurred in the area.

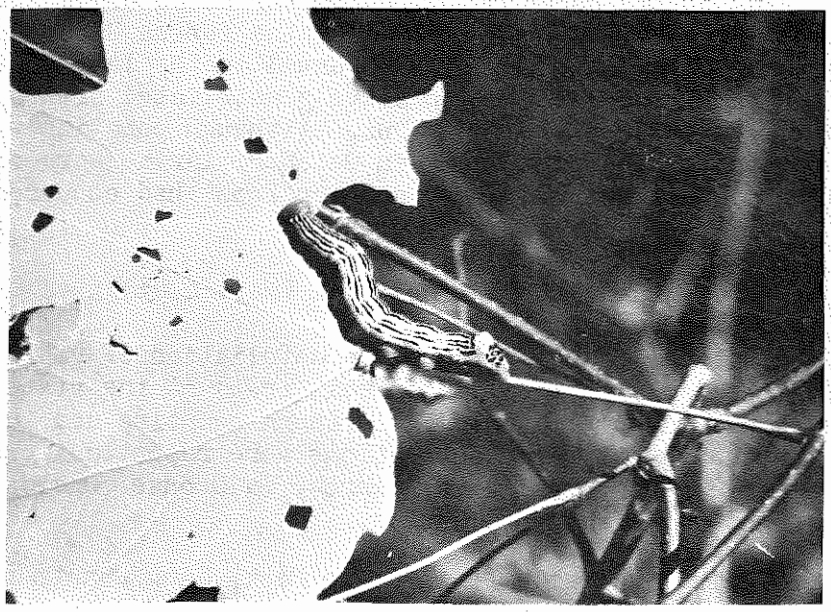
Oak Skeletonizer -- Bucculatrix ainsliella (Murtfeldt)

Heavy infestations resulted in severe defoliation of red and black oak stands, particularly in the lighter soil areas of the state. Browning of foliage was apparent by mid-July in northern counties and the last half of June in the south. High populations were reported in Barron, Buffalo, Burnett, Jackson, Marinette, Monroe, La Crosse, Oneida, Polk, Sauk, Trempealeau, and Washburn Counties.

Larvae collected in Devil's Lake State Park, Sauk County, on July 6, were pupating when collected and a few moths had emerged by July 11. Specimens collected in La Crosse County on July 14 had pupated by July 18. Larvae were pupating in Marinette County by July 17. Most of the Sauk County specimens were parasitized by tiny black wasps which started emerging on July 20. Heavy pupal parasitism was also reported from most areas of severe defoliation.



Hard maple stand in Vilas Co. completely defoliated by the red-humped mapleworm. Ironwood and yellow birch were not palatable.



Red-humped mapleworm larva feeding on hard maple.

Birch Skeletonizer -- Bucclatrix canadensisella (Chamb.)

Defoliation of white birch stands in Clark, Eau Claire, Jackson, and Wood Counties was more extensive than in 1960. By late August, browned or stripped birch stands were common throughout the Northeast Area, particularly in Langlade, Oconto, and Marinette Counties.

Large Aspen Tortrix -- Archips conflictana (Wlkr.)

Extensive areas of severe defoliation were reported in aspen stands in parts of Rusk, Price, Taylor, Chippewa, and Ashland Counties. Generally, the areas of heaviest defoliation were smaller than in 1960, and some stands in the western part of the infestation showed little or no defoliation indicating a collapse of the population. However, this was the third year of moderate to heavy defoliation for some stands and there were reports of twig mortality. Larval feeding was completed by June 15.

European Pine Shoot Moth -- Rhyaciona buoliana (Schiff.)

Horizontal spread of this pest has been slow since it was first found in the Kettle Moraine area in 1949. The population is increasing rapidly in the Point Beach area since the low of 1958-1959 except in a block that was sprayed in 1959.

Moth emergence occurred during the first two weeks of July on red pine and about a week later on white pine. Damage on white pine is not as destructive as on red pine. These sites (except for lack of an overstory) are more suitable for white pine.

Zimmerman Pine Moth -- Dioractria zimmermani (Grote)

Numerous reports of injury to trees were received, particularly in the west and east central counties. Infestations in forest stands were not serious, but the pest was a serious problem in a few Christmas tree plantings, especially on Scotch pine. One grower attempted control by aerial applications of insecticide on 180 acres of plantations in Adams and Wood Counties. Attacks were mostly associated with previous injury to trees such as shearing wounds, and areas damaged by rusts. Larvae were also observed boring in new terminals.

Forest Tent Caterpillar -- Malacosoma disstria (Hbn.)

Overwintering egg surveys revealed no viable egg masses. No larvae were reported by observers during the growing season.

Maple Blight Associates -- Sparganothis acerivorana (McKay)
Acleris chalybeana (Fernald)
Tetralopha sp. near asperatella

Insects associated with the maple blight problem were found throughout the northern hardwood type in endemic numbers. Tetralopha sp. were observed working on the Menominee County Forest on September 17, 1961.

Walnut Caterpillar -- Datana integerrima Grote and Robinson

Most of the walnut trees in east central and west central counties were severely defoliated. Although the insect has seldom been reported in west central counties a few ornamental walnut trees and some butternut trees were defoliated in 1961.

Larch Casebearer -- Coleophora laricella (Hbn.)

Populations were very light in all counties. Pupation occurred at Nevin Hatchery, Dane County, by May 22.

Pine Webworm -- Tetralopha robustella Zell.

Light infestations were observed on jack and red pine in several west central counties. Numbers were greater than in 1960, but no serious damage was reported. Localized heavy infestations were reported on East Central Area red pine planted in 1960 but damage was negligible.

Unidentified Tortricid

A tortricid was observed attacking new growth of white pine planted in grassy areas in east central counties. The larvae apparently found the new white pine growth more palatable than the grasses and were able to make the changeover successfully. While the trees were set back a season, a recurrence of this unusual condition is not expected.

ORTHOPTERA

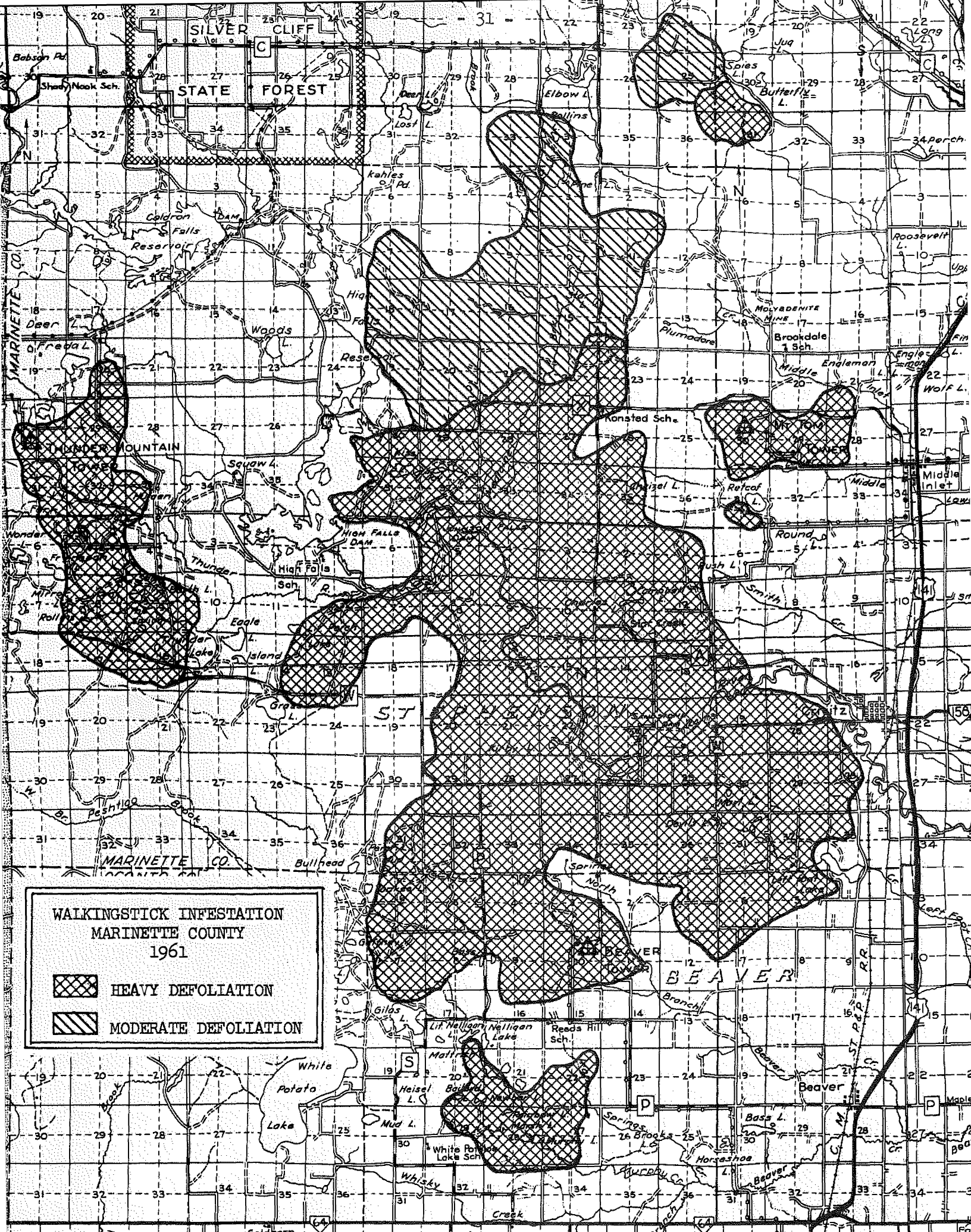
Walkingstick -- Diaphermora femorata (Say)

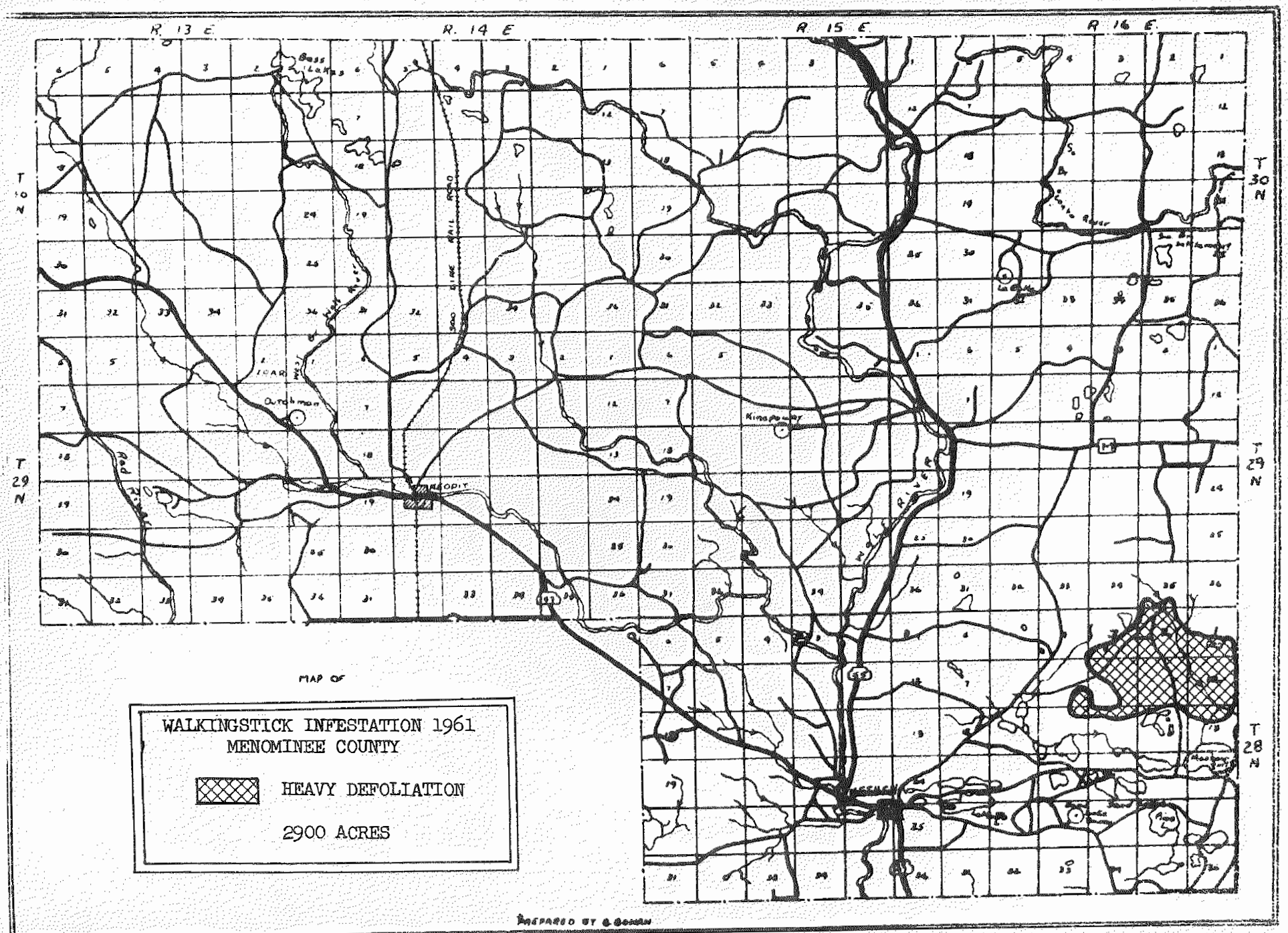
The most extensive problem area was in Marinette County. Moderate to severe oak defoliation, as mapped from the air, extended over an area of about 36,000 acres in 1961. In the same part of the county similar defoliation occurred on approximately 11,500 acres in 1959. The defoliation mapped was not due entirely to the walkingstick. Large patches of oak were stripped primarily by the post-oak locust, Dendrotettix quercus Packard. Since light defoliation is not discernible from the air the insects were active over an area larger than that indicated by the aerial survey. (Maps on pages 31 and 32).

Oak mortality on five 1/5-acre plots established in 1959 was negligible. Two small trees were found dead on all the plots and evidence was present that indicated the trees may have died from causes other than defoliation.

A plot which had an egg count of 175 per square foot in 1960 had only moderate defoliation. On this same plot the male walkingsticks outnumbered the females by three to one in September, 1961.

Large brown pentatomids, found over most of the Marinette County infestation area, were feeding on the oak locusts, but would also feed on walkingsticks when the two insects were confined in the same cage. The pentatomids were very active the last week of September, 1961.


SILVER CLIFF
STATE FOREST
Babson Rd.
Shady Nook Sch.
Deer L.
Lost L.
Elbow L.
Collins
Juq L.
Spies L.
Butterfly L.
Perch L.
Kahles Rd.
Caldron Falls Reservoir
DAM
Deer L.
Freda L.
Woods L.
Reservoir
MARINETTE CO.
Roosevelt L.
Molybdenite Mine
Plumadore
Brookdale Sch.
Middle Inlet
Engleman
Wolf L.
Konsted Sch.
TOWER
THUNDER MOUNTAIN
TOWER
Squaw L.
Wonder L.
Thunder L.
Eagle L.
Island L.
Gravel L.
HIGH FALLS DAM
High Falls
Sch.
Rhinehart Falls
Retcof L.
Round L.
Bush L.
Smith
Creek
Carlshend
Deer Creek
Devils Lake
Spring
North
Left Fork
Lake
Peshtigo Br.
Peshtigo River
Bullhead L.
MARINETTE CO.
Gravel Pit
Pit
Quarry
Pit
Gilos L.
Lit Nelligan L.
Nelligan Lake
Reeds Hill Sch.
Matfield
Heisel L.
Bailey L.
Mud L.
White Potato Lake Sch.
Springs
Brooks
Horseshoe L.
Murphy Cr.
Whisky Creek
Goldhorn
BEAVER
Branch
Beaver
Beaver Cr.
Bass L.
Maple
C.M. St. P. & P. R.R.
WALKINGSTICK INFESTATION
MARINETTE COUNTY
1961
HEAVY DEFOLIATION
MODERATE DEFOLIATION


R. 13 E.
R. 14 E.
R. 15 E.
R. 16 E.
T 30 N
T 29 N
T 28 N
Bass Lake
Outchman
Kingsford
Iron Mt.
Red Ridge
Norway
MAP OF
WALKINGSTICK INFESTATION 1961
MENOMINEE COUNTY
HEAVY DEFOLIATION
2900 ACRES
PREPARED BY

Walkingstick defoliation was also observed in the Towns of Bevent (1,200 acres), Franzen, and Elderon (not mapped), Menominee County (2,900 acres), the Town of Underhill in Oconto County (750 acres), and about 2,000 acres in Eau Claire County (T 26 N, R 5 W).

Notes:

June 29 - First and second instar nymphs in Marinette County.
July 17 - Mostly third instar nymphs in Marinette County.
July 31 - Mostly fourth instar nymphs in Marinette County.
Aug. 7 - Stages ranged from third instar to adults, Marinette County.
Aug. 15 - Mating pairs, Marinette County.
Sept. 7 - Adult stage predominant in Eau Claire County.
Sept. 29 - Oviposition occurring in Thunder Mountain Area, Marinette County.
Oct. 13 - A single gravid female collected in the Madison School Forest, Dane County.

Post-Oak Locust -- Dendrotettix quercus Packard

Within the Marinette County walkingstick infestation area, sizeable tracts of scrub oak were defoliated by the post-oak locust. Stands not previously defoliated by the locust in 1959 were reported in the Towns of Armstrong and Brazeau in Oconto County.

The locusts were very numerous in Marinette County oak stands the last week of September and were commonly observed impaled on the beaks of large pentatomids which were also present in large numbers.

Severe defoliation of oak occurred in the same areas of southern Wood and northern Adams Counties as reported in 1959. Defoliation ranging from light to severe was observed in several localities in Adams, Jackson, Juneau, and Monroe Counties.

Grasshoppers -- Melanoplus sp.

High populations of grasshoppers of various species were a nuisance in some young conifer plantations. No serious damage was noted but Christmas trees in a few plantations were reduced in value due to the feeding by grasshoppers. One owner of plantations in Wood and Adams Counties used an aerial spray to reduce tree injury.

OTHER INSECTS REPORTED

COLEOPTERA

Common Name	Scientific Name	Area(s)
Bronze Birch Borer	Agrilus anxius (Gory)	NE, EC
Twig Beetle on White Pine		EC
European Larch Beetle	Dendroctonus simplex LeConte	EC
Elm Leaf Beetle	Gallerucella luteola (Muller)	NW
Powder Post Beetle	Lyctus sp.	EC
Locust Borer	Megacyllene robiniae (Forster)	NE, EC
White Grubs	Phyllophaga sp.	NW, NE
----------	Pissodes approximatus (Herbst)	NE
Poplar Borer	Saperda calcarata (Say)	NE
Smaller European Elm Bark Beetle	Scolytus multistriatus (Marsham)	EC
Weevil	Sciaphilus asperatus Donsd.	NE

DIPTERA

Balsam Gall Midge	Cecidomyia balsamicola Lintner	NW
Pitch Midge on Pine		NW
Red Pine Needle Midge	Thecodiplosis piniresinosae	NW, NE, EC, WC

HEMIPTERA

Pine Spittlebug	Aphrophora parallela (Say)	NW, NE, EC, S
Spruce Gall Aphid	Chermes abietis (Linnaeus)	NE
White Pine Aphid	Cinara strobi (Fitch)	NW
Pine Needle Scale	Phenacaspis pinifoliae (Fitch)	NE, WC, EC
Pine Bark Aphid	Pineus strobi (Hartig)	NW, NE, WC, EC
Cottony Maple Scale	Pulvinaria Vitis (Linnaeus)	NW, S
Hickory Phylloxera		EC
Wooly Aphid on Spruce		EC

HYMENOPTERA

Pine False Webworm	Acantholyda erythrocephala (Linnaeus)	EC
Black Carpenter Ant	Campanotus pennsylvanicus (DeGeer)	EC
Dusky Birch Sawfly	Croesus latitarsus Norton	NE, EC, S
Birch Leaf Miner	Fenusa pusilla (Lepeletier)	NE
Balsam Fir Sawfly	Neodiprion abietis (Harris)	NE
Jack Pine Sawfly	Neodiprion americancus banksianae Rohwer	NE
Red Pine Sawfly	Neodiprion nanulus nanulus Schedl.	NE
White Pine Sawfly	Neodiprion pinetum (Norton)	S
Yellow-Headed Spruce Sawfly	Pikonema alaskensis (Rohwer)	NE
Pigeon Tremex	Tremex columba (Linnaeus)	NE

LEPIDOPTERA

Green-Striped Mapleworm	Anisota rubicunda (Fabricius)	EC
Ugly Nest Caterpillar	Archips cerasivorana (Fitch)	NE, EC, S
Pine Tube Moth	Argyrotaenia pinatubana (Kearfott)	NE, EC

Common Name	Scientific Name	Area(s)
Birch Skeletonizer	Buccalatrix canadensisella (Chambers)	NW
Cherry Scallop Shell Moth	Calocalpe undulata (Linnaeus)	EC, S
Large Aspen Tortrix	Choristoneura conflictana (Walker)	NE
Spruce Budworm	Choristoneura fumiferana (Clemens)	NE
Pine Tussock Moth	Dasychira plagiata (Walker)	NE
Walnut Caterpillar	Datana integerrima Grote & Robinson	S
Yellow-Necked Caterpillar	Datana ministra (Drury)	EC
Zimmerman Pine Moth	Dioryctria zimmermani (Grote)	NW, WC, S
Jack Pine Shoot Borer	Eucosma sonomana Kearfott	NW, EC
White-Marked Tussock Moth	Hemerocampa leucostigma (J. E. Smith)	NE, EC, S
Fall Webworm	Hyphantria cunea (Drury)	EC, S
Eastern Tent Caterpillar	Malacosoma americanum (Fabricius)	NW, EC, S
Forest Tent Caterpillar	Malacosoma disstria Hubner	NE, WC
Mourning-Cloak Butterfly	Nymphalis antiopa Linnaeus	NE, EC, S
Pitch Blister Moth	Petrova albicapitana (Busck.)	NW, NE, WC, EC, S
Larch Case Bearer	Pristophora erichsonii (Hartig)	NW, EC
Spruce Needle Miner	Recurvaria sp.	EC
Red-Humped Oakworm	Symmerista albicosta Hubner	NE
Pine Webworm	Tetralopha robustella Zeller	NW, NE, WC, EC, S
Bagworm (On red cedar)	Thyridopteryx sp.	NE

MISCELLANEOUS TREE DAMAGE

Mice

Mouse damage was reported from a small plantation in Vernon County. Ninety per cent of the red pine was destroyed but white pine planted in alternate rows was only slightly bothered. Similar damage was reported from a Juneau County plantation.

Gophers

Pocket gopher damage was observed in a few Jackson County plantations.

Snow

A fall of heavy, wet snow on November 16, 1961, caused considerable damage to jack pine stands in eastern Jackson County and surrounding areas. Damage was most severe in large reproduction and small pole stands where many stems were broken and others bent or root-sprung. Red and white pines sustained some top breakage, but generally came through in much better condition.

The loss in the Black River State Forest was estimated at eight to ten thousand cords. It was estimated that about two thousand cords would be salvaged.

Winter Injury

Damage was slight in all areas.

MAJOR FOREST DISEASES REPORTED

WILTS AND DIEBACKS

Oak Wilt -- Ceratocystis fagacerum (Bretz) Hunt

In the southern and west central counties, the spread of oak wilt occurred primarily on pin and black oak sites. New oak wilt pockets appeared in disturbed areas in the east central counties, while many old pockets ceased to advance after spreading for several seasons.

Four oak wilt pockets, each one acre in size, were treated in Columbia County. Healthy trees bordering the pockets were either cut or girdled and the root collars poisoned with sodium arsenite.

Vapam barrier strips were established to prevent the spread of two oak wilt pockets in Sauk County. One of these pockets was located in Devil's Lake State Park, the other in a farm woodlot in Fairfield Township.

Verticillium Wilt -- Verticillium albo-atrum Reinke & Berth

This disease was prevalent on ornamental sugar maple and catalpa trees in the southern part of the state. Symptoms were most evident in July and August.

Note:

In Monroe (Green County) six maple trees displayed symptoms on July 7. The fungus was isolated from a wilting catalpa tree on July 28 near Verona (Dane County). Twigs collected on August 23 from a wilting maple in Antigo (Langlade County) yielded the fungus in culture.

Dutch Elm Disease -- Ceratocystis ulmi (Buisman) Moreau

This disease was positively identified in the city of Marshfield (Wood County). Infected trees were in the vicinity of the Roddis plywood plant. It is probable that the disease was brought into the area with infected logs. This is the only report of the disease in the west central and northwestern counties. However, the disease has been reported in the Minneapolis - St. Paul area, placing an infection source near these areas.

Maple Dieback (unknown)

Symptoms were observed in Sauk County. At the base of affected trees, fruiting bodies of Xylaria polymorpha (Fr.) Grev. were observed.

ROOT ROTS

Shoestring Root Rot -- Armillaria mellea Vahl ex. Fr.

Individual and small groups of pine were killed by this disease in plantations throughout the state. In most cases the plantations contained hardwood stumps that furnished the inoculum. In Clark and Eau Claire Counties, five red pine plantations were affected by this disease. In Oconto and Shawano Counties, the pathogen was common in older jack pine plantations. Some mortality occurred to red pine in Marinette County.

Armillaria mellea also appeared to be a contributing factor in the mortality of Eastern Hemlock sawtimber in Menominee County.

HEARTROTS AND DECAY

Spongy White Butt Rot -- Armillaria mellea Vahl. ex. Fr.

This fungus appeared to be the major butt decay in hardwoods throughout the state. Sugar maple was primarily affected, followed by black and red oak. Decay usually increased with the age of the tree and was found up to a height of six feet.

Note:

Fruiting bodies were first observed on oak stumps in Dane County on September 29. On October 13, 1961, most sporophores had ceased growing and began to decompose.

Soft White Trunk Rot of Oak -- Fomes everhartii (Ell. & Gall.) Schrenk

This conk was frequently observed on black and northern pin oak in Rock, Dane, Sauk, Adams, and Wood Counties. Trees of all size classes were infected.

Note:

Fruiting bodies were observed sporulating on October 26 in Dane County.

White Sapwood Rot -- Polyporus gilvus (Schw.) Fr.

This fungus appeared to be the major sapwood decayer on oak wilt killed trees. The fungus was commonly found fruiting on trees one to two years after they were killed by oak wilt.

White Mottled Rot of Ash -- Fomes fraxinophilus (Pk.) Sacc.

Fruiting bodies were found abundantly on white ash in bottomland hardwoods along the Wisconsin River in Dane and Iowa Counties.

Brown Mottled Rot -- Pholiota apiposa Fr.

Fruiting bodies were observed fruiting on basswood trees and logs in Sauk County on October 13.

Red Rot or Red Ring Rot -- Fomes pini (Thore) Lloyd

This fungus is the major cause of decay in white pine sawtimber in Menominee County. Estimated cull from this decay amounts to 20 per cent of the total volume.

Red Brown Butt Rot -- Polyporus schweinitzii Fr.

Sporophores of this fungus were observed at the base of white pine sawtimber in Menominee on November 14.

RUSTS

White Pine Blister Rust -- Cronartium ribicola Fischer

Blister rust control projects with the antibiotic Phytoactin were established in Waushara and Sauk Counties in June and July. Infected pole size trees were basal sprayed with 200 p.p.m. of Phytoactin in fuel oil. The sprayed trees will be inspected annually to determine the effect of the antibiotic on the fungus.

Note:

Aecia were first observed on May 25 in Columbia County.

Sweet Fern Blister Rust -- Cronartium comptioniae (Schw.) Thuem.

Aecia were first reported fruiting on jack pine in Oneida County on May 24. Aecia that had not yet discharged their spores were found on jack pine near Gordon (Douglas County) on June 22.

Pine Needle Rust -- Colesporium solidaginis (Schw.) Thuem.

Numerous plantations throughout the state were infected with this disease. All reports of the disease came from plantations with trees not more than seven feet tall. The lower branches on larger trees were infected, while small seedlings had all but the current year's growth infected. In all cases the plantations were close to goldenrod and aster, the alternate hosts of the disease.

Badly infected jack pine seedlings in Lincoln County that produced abundant aecia in 1960 recovered in 1961 with no apparent loss in growth. In Sauk County three foot tall red pine seedlings that had aecia on 80 per cent of the needles in May were healthy when examined in September.

Note:

Aecia were first reported on red pine on May 25 in Monroe County, May 29 in Rock County, May 31 in Sauk County, and June 6 in Rusk County.

FOLIAGE DISEASES

Antrachnose -- Gnomonia sp.

Symptoms were observed on June 6 in Dane and Sauk Counties. Sycamore and white oak were most commonly infected. However, infections were less severe than in 1960.

Tar Spot -- Rhytisma acerinum Pers. ex. Fr.

Tar spot was reported as being widespread on red maples in Burnett County. This disease was first reported on June 16.

Leaf Spot of Hawthorn -- Entomosporium thuemenii (Cke.) Sacc.

This leaf disease completely defoliated a Manitowoc County hawthorn by August 21.

A Leaf Spot on Norway Maple -- Cercospora sp.

A leaf spotting disease occurring on Norway maple in Milwaukee County was identified as Cercospora sp.

Needle Cast of Spruce -- Rhizosphaera kalkhoffii Bub.

This organism was identified on white spruce needles submitted by Kimberly Clark Corporation from a plantation near Gauld City, Michigan. It was reported that several trees, five to ten feet tall, had 30 per cent of the needles yellowed. This needle disease was also observed on white spruce trees in Dane County.

Pine Needle Rust -- Coleosporium solidaginis (Schw.) Thuem.

(See section on Rusts)

White Pine Needle Blight (Unknown)

An orange-red discoloration of the current year's needles was observed on scattered white pine plantings in Sauk County on May 6 and in Grant County on August 31.

MISCELLANEOUS

Eutypella canker -- Eutypella parasitica (Davidson & Lorenz)

Eutypella canker was observed commonly on sugar maple throughout the northern part of the state. In the southern part of the state the disease was rarely detected. The furthest south the disease was observed was in Iowa County.

Strumella canker -- Strumella coryneoidea Sacc. & Wint.

Although cankered trees were not found in Columbia County, Urnula craterium (Schw.) Fr., the suspected perfect stage of Strumella coryneoidea which is the incident of strumella canker, was found fruiting on white oak logs in Columbia County on May 25.

Pullularia pullulans (de Bary)

This fungus was isolated from branches of a deteriorating silver maple windbreak in Manitowoc County on July 17.

OTHER DISEASES REPORTED

Host	Fungus
White Pine	Fumago sp.
Ironwood	Fusarium sp.
Red Cedar	Gymnosporangium juniperi-virginianae Schw.
Jack Pine	Hypodermella ampla (Davis) Dearn.
	Cronartium cerebrum Hedge & Long
Red Pine	Lophodermium pinastri (Schrad. ex. Fr.)
White Oak	Phoma sp.
Norway Spruce	Cytospora sp.
Aspen	Hypoxylon pruinatum (Kl.) Cke.